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An Address

ON

THE DUTY OF THE PHYSICIAN IN THE PRESENCE OF ECLAMPSIA*†

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ECLAMPSIA exists and will always exist in spite of the closest observation and the repeated examination of our patients. Its manifestations break out with disconcerting suddenness, and it is truly a terrible disease. The fact that the maternal mortality reaches 25 per cent and the fetal mortality 50 or even 70 per cent will indicate the great importance that this subject has for the practitioner.

When confronted with a patient whom one thinks to be the subject of eclampsia there are three important questions to ask oneself, and these questions will form the subject matter of this address.

1. Is it really a case of eclampsia?
2. What is the gravity of the particular case presented?
3. What course of action should be taken in the case in question?

I. IS IT REALLY A CASE OF ECLAMPSIA?

This question may present itself for answer at three different times: (a) before the appearance of the attack; (b) during the attack; and (c) in the comatose period that follows the attack.

An important point is that an accurate diagnosis be made early, for it often enables the practitioner, by his conduct of the case, to prevent the onset of the attack. How can a positive

diagnosis be made before the appearance of the convulsive seizure? By the study of the prodromal features.

The prodromata are most particularly observed in primiparæ, but multiparæ may also manifest them. They appear most often during the last three months of pregnancy, not in those who are the subjects of chronic albuminuria or who have been treated for this affection, but in women who have not had albuminuria except for a few days or perhaps even for a few hours. Sometimes a very definite cause can be made out, such as an alimentary intoxication, exposure to cold, or overwork.

The study of the prodromata may be divided into four main groups, according to the way in which they manifest themselves.

Urinary apparatus. Albuminuria may appear in a very fulminating way, the quantity of albumen often rising very quickly to thirty or forty grammes; at other times increasing steadily for some days. The quantity of urine as a rule tends to be reduced, and this feature may be very pronounced. Such urine is always very dark and occasionally may be frankly bloody.

Circulatory system. Hypertension is a symptom, the highest point reaching often 20 or 25, or even more. Edema is extremely variable. It may affect the lower limbs, the upper limbs, sometimes may be absent, but is rarely lacking in the face.

Nervous system. The patient has a constant

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and generalized headache. She complains of sleeplessness at night and somnolence during the day; she may even be somewhat stuporose. She suffers from trigeminal neuralgia, particularly affecting the ophthalmic branch of the nerve; she manifests sensory disturbances, notably visual, and ringing in the ears.

Digestive system. Vomiting is a constant prodromal symptom, and Chausier has well described the epigastric pain, as like a bar, which has caused his name to be given to this particular sign.

The duration of these prodromal features is essentially variable, from a few hours to several days, and sometimes they are almost lacking. In certain cases, as the result of a treatment that abolishes the symptoms, these prodromata constitute alone the whole disease. This is the condition that Bar has called "eclampsisme." During this period, in order to make a differential diagnosis, it is necessary to distinguish uræmic crises from the simple alimentary intoxication due to digestive disturbances.

When you are in the presence of a patient undergoing a convulsive seizure diagnosis is easy, owing to the fact that the attacks are always characteristic.

Let us study first the positive case. The diagnosis will be summed up in the description of the attack, which develops invariably in three phases. The first phase is that of *invasion*. The woman suddenly manifests contractions of the face which last only a few seconds. The second phase is that of *tonic convulsions*. These convulsions are generalized throughout the body, the muscles of respiration only excepted, and have a variable duration of from six to ten seconds. The third phase is that of *clonic contractions*. In this phase it is above all the muscles of the sub-diaphragmatic region of the body that are affected; the upper limbs "beat the recall", the lower limbs remain immobile. The duration of the convulsions is about thirty seconds, which seem interminable hours to those around, for the patient is labouring and seems to suffer so much. In making the differential diagnosis one must eliminate (1) the epileptic seizure, during which the patient always voids clear urine; (2) a hysterical attack, which can be excluded by the disorder of the convulsions and the absence of all signs of disturbed function, and (3) a uræmic attack, which is often confused with eclampsia, but this error does not signify, for the treatment is the same. It is necessary,

in all cases which have to do with eclampsia, to take cognizance during the whole course of the disease of the hypertension, of the scantiness and dark colour of the urine, of the enormous amount of albumen in the urine.

In the presence of coma you will agree that there is no character pathognomonic of the eclamptic form. It will be necessary to base your diagnosis upon the history, the albuminuria, the scantiness of the urine, and the hypertension. You should remember to differentiate eclamptic coma from that of diabetes, alcoholism, uræmia, and from cerebral hæmorrhage and hetero-intoxication.

II. WHAT IS THE GRAVITY OF THE CASE?

One must keep clearly in mind two most important ideas when it is desired to estimate the prognosis in eclampsia. Eclampsia is a very serious accident, a "malady of surprise," and a surprise of a disagreeable order, using the phrase that Tarnier used to delight in repeating to his pupils. One should always and in every case guard the prognosis for the mother, and especially for the fetus. However, cases can be differentiated, and one should weigh the several factors, such as, the time of onset of the eclampsia, the number of seizures, the coma, the urine, the hypertension, the temperature, and any complications that may arise, before one can estimate the outcome in a definite way.

When eclampsia appears in a woman but little advanced in pregnancy the case is always most grave; if the seizure comes on at the moment of labour the prognosis will be less serious than if earlier in the pregnancy; if the seizure occurs just subsequently to delivery the outlook is better; if the accouchement has preceded the attack by some hours the prognosis is still better.

When the patients have had from one to ten seizures one-quarter of them die; when they have had ten to twenty, one-third die; when more than twenty, one-half succumb. However, there are exceptions, for patients may die after the first or second attack, and the number of attacks always indicates the degree of severity, so that the prognosis should be guarded accordingly.

When the patient is in a state of coma the gravity is in proportion to its duration; if the coma is prolonged it involves a fatal issue.

The quantity of albumen that is present in the urine is not a valuable guide in the establishment of the prognosis. It is, rather, oliguria or anuria that are the grave factors, particularly if the

urine remains bloody. On the contrary, one would take a more favourable view in the presence of a urinary crisis. Polyuria is one of the good features, as it shows that the kidneys are eliminating satisfactorily.

Hypertension is always of unhappy augury, especially when it remains high, or rises again after bleeding.

Hyperpyrexia presents always a grave character, and the prognosis will be still more guarded in such a case.

Finally, the complication with icterus or cerebral hæmorrhage is always of grave import. The psychoses, which are generally of late appearance, are of little interest; acute mania, however, can occasion considerable disorder, and melancholia often becomes chronic.

III. WHAT PROCEDURE SHOULD BE ADOPTED?

I come now to the question of treatment, which is, without doubt, the matter that most interests the physician in general practice. The treatment is of two orders; it is *prophylactic*, and it is *curative* or *symptomatic*.

As soon as albuminuria appears in a gravid patient you should be on the look-out for eclampsia. Every day you should check in these cases the amount of urine discharged, the amount of albumen per litre, and the arterial tension. Should any of the symptoms appear, you should institute immediately a milk or even a water diet, rest in bed should the albumen be more than 0.50 centigrammes per litre, protection from the cold by means of warm clothing and flannel bands, and venesection if there is hypertension.

In spite of the most careful surveillance of your parturient patients there will be some who develop signs of eclampsia unexpectedly and you must treat them. In the prodromal period, before there has been a convulsive seizure, everything must be done to prevent one. There should be absolute rest in bed, a diet of lactose and water, a drastic purge, venesection if indicated by hypertension, which may enable you to avert the seizure. If in spite of this treatment the symptoms increase, you should bring on labour, provided that the woman is near term and that the child is viable. When a seizure threatens you can sometimes avert it by chloroform anæsthesia. The patient should be prevented from biting her tongue or otherwise injuring herself. Between the convulsive attacks the treatment will be variable, either medical, or obstetrical, or, exceptionally, surgical.

Medical treatment consists in lessening arterial tension by repeated bleeding; the intoxication of the patient should be lessened by a fluid diet, and by the injection of glucose serum to favour diuresis; finally, the nervous system must be quieted. Keep the patient in a dark room, remote from noise; forbid all visits except those of the nurse in charge. Prescribe small enemata of chloral, and in cases of great agitation you may be forced to administer sedatives in the form of morphine or opium.

The obstetrical treatment comes to the fore when the woman is in labour. Then, at all costs, the delivery should be accomplished as quickly as possible. On the contrary, when the woman is not yet in labour, when the fetus is not viable, and when the eclampsia is mild, it is clear that you should wait and be satisfied with medical treatment. Interfere only when the fetus is viable, when the eclampsia seems serious. In such cases the procedure of choice, in the interest as much of the mother as of the child, is the vaginal Cæsarian section.

The surgical treatment concerns almost without exception the specialist in urology, and is employed only in cases of anuria. Here decapsulation of the kidneys, or nephrotomy, is indicated.

Once the convulsive phase has passed, it is your duty to watch the patient very narrowly while in coma, in order to prevent her from falling out of bed. A water diet should be maintained at least for forty-eight hours; then allow a little milk and later a purely milk diet, until you can note that a urinary crisis has occurred and that there has been a considerable diminution in the albuminuria, when a vegetable regimen may be instituted.

CONCLUSIONS

Eclampsia is easy of diagnosis; all that is required is to note the quantity of urine passed in twenty-four hours by the patient with albuminuria, and to take the arterial tension frequently.

Eclampsia always involves a very serious prognosis and one often difficult to establish. It must be remembered that it is a "malady of surprise," and the surprise is of a disagreeable kind; as a complication it may come on in the late period.

Everything should be done to prevent the onset of convulsions. Here venesection plays an important role.

An Address

ON

THE VALUE OF PERIODIC HEALTH EXAMINATIONS*

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THE desire to escape from sickness and to achieve health is not a new one. No man ever wished to suffer from disease, and history records how mankind has evaded and fought disease as best it knew how.

We are today in a very enviable position as compared with the ancients. We have the knowledge which, if we would use and apply it, could cut in half the amount of sickness that now occurs in our country, thus greatly reducing human suffering, and the needless expense and other undesirable companions of sickness. Our increase in knowledge has made us feel rather superior. We smile with pity upon those who believed in the supernatural cause of disease, in witchcraft, the healing power of the King's touch, the influence of the evil eye, and the relationship between the stars and disease. But are we superior? Could there be any greater ignorance, in the light of present-day knowledge, than that displayed by those who still deny that successful vaccination prevents smallpox, or who, if they do not deny it, fail to practise it, which amounts to the same thing. There are those who quibble also about the value of pasteurization as a means of making milk supplies safe. The present will assuredly seem absurd when it becomes historical.

In seeking an explanation to account for illness and death from preventable diseases and for the lack of health, we find that two of the chief factors are ignorance and laziness.

Health, it must be understood, implies not only freedom from disease, but a one hundred per cent development of the capacity of the individual. Doctor Donald B. Armstrong has defined health in these words:—"The vigorous, beautiful, smooth-running, efficient operation of mind and body, of the instincts and the will, in a harmony of purpose and accomplishment."

It is rather remarkable that so few attain com-

plete health, when we consider that, beyond question, health is such a desirable possession—desirable, not in the sense that health in itself is an end in life, but rather because, as a condition of life, it makes possible achievements and happiness in work and play that without it are unobtainable. Health is therefore good both for the individual and for the community.

The modern public health movement grew out of a humane desire to lessen the human misery which had resulted from the industrial revolution. It was directed, at first, almost entirely to the improvement of living and working conditions—sanitation as we now call it. There were added later isolation and quarantine, *i.e.*, the control of communicable diseases.

People, in general, will agree as to the need for pure water, for safe milk and pure food, and will even support the principle of quarantine, the latter, however, perhaps, with the mental reservation that it applies to the other man's home and family. In other words, we favour those measures which improve things for us, providing that they call for no personal effort. So it is that those health measures which ask for nothing from the individual, excepting money, for their provision and enforcement, come about and are carried on successfully. After all, taxes for health work are just as painless as any other taxes.

This sort of community health work does a great deal to protect citizens from disease that is carried by milk, water and food, and it does control, to a considerable extent, the communicable diseases which are spread from one human being to another. It has limitations, however, and it makes very little contribution towards the positive ideal of health, the one hundred per cent development of the physical and mental capacity.

Individual health depends essentially upon the individual's practice of what we call "personal hygiene." Even in our age of organization, we expect that we must consider our bath, our bed-

* Delivered at a public meeting of the Canadian Medical Association, Charlottetown, June 21, 1928.

time, and our open bed-room window as personal responsibilities. Modern inventions have given us conveniences that greatly assist and make reasonably easy the practice of personal hygiene. The opposition that followed the introduction of the first bath-tub on this continent, in Cincinnati in 1842, leads us to believe that bathing was not a very generally accepted practice. One can hardly doubt that since the bath-tub has become a common household fixture, its use has materially increased.

Children may practise hygiene because of parental discipline, or the stimulation of personal pride, or the competitive spirit of the group, as seen in such organizations as the Junior Red Cross.

As adults, we practise personal hygiene chiefly as an established habit carried from childhood, and continued, largely, because we have found that it makes us more comfortable. We continue to raise our bed-room window at night, not in the interest of health, but because we have found that we are more comfortable, that we feel better in the morning after having slept in a well-ventilated room. We know that if we do not wash our hands before eating, we are uncomfortable during the meal. This, I believe is most encouraging. We may expect the majority of people to practise personal hygiene because they will like it because it will make them feel more comfortable. I do not believe we can ever expect that any considerable number of persons will do things they do not like just for the good of their own health, still less for the good of others. Most of us are as self-centred as the man who, according to the old doggerel, prayed:—

"God bless me and my wife,
Our John and his wife,
Us four and no more. Amen."

There is given to us, in the periodic health examination, an opportunity to secure a larger percentage of health. The periodic health examination by the family physician offers something that is not to be secured in any other way.

There is no lack of general health advice. Such advice is good and is valuable within limitations. Its value is limited because it is general. Of those who read it, or who hear it, many fail to see or understand the personal implication or the need for personal application. While none of us denies the desirability of health, so long as we feel well, so long as we can continue to participate in our favourite pleasures, we are

apt to think that such general health advice does not apply to us, but that it is intended for someone else.

It is desirable that everyone be accurately and fully informed concerning this most important subject of health. The value of such information depends upon its practice. One may know all about the human body, the causes of disease, and the maintenance of health, but unless this knowledge is put to work and made part of the daily life of the individual, it will be useless so far as protecting that individual is concerned. To know that fresh air and sunshine are good is only of academic interest to the person shut up in a dark room; it is of practical value when the window is opened, or when he goes outside. This is a very obvious example, and yet it is one which we see every day. While their number is decreasing, there are still thousands of people in our country who sleep in bed-rooms with windows tightly closed, at least, in winter. There are still many who shut the sun out of their homes rather than fade a carpet, although all of these have doubtless heard of the value of fresh air and sunlight. Most of us are just as foolish with regard to some one or other of the rules of personal hygiene. In most cases, it is because we have not understood or appreciated why these rules must be applied to our individual life. We need to have this pointed out to us, we need to be periodically checked up on it, and that is exactly what the family physician will do in the periodic health examination.

There has been a great reduction in mortality during the past few years, with the result that the average expectancy of life has been markedly increased. But because the reduction in mortality has been chiefly in the younger age group, there has been but little increase in life expectancy for those of forty years of age. This has not happened by chance. It is for the one simple reason that health conditions amongst children have received a great deal of attention in most places, and the reduction in sickness and deaths amongst infants and children has been in proportion to the work done. Look back over the health record of any city, and you will see written in the vital statistics, a remarkable story. After a number of years with the same high infant death-rate comes a period of rapid decline. You seek for the reason and you find two things. First, the establishment of well-baby clinics where mothers are taught the care of their babies, and second, the safeguarding of the milk

supply. The extent and rate of the reduction in infant deaths depend upon the extent and thoroughness of these two efforts. This infant hygiene work is a striking example of the use of knowledge. It is available for any community but it must be used if lives are to be saved. Simply to know about it, to talk about it, means nothing in the saving of lives.

The insidious beginnings of disease are not recognized by the sufferer. They are allowed to progress to serious conditions before the need for medical care is evident. It is left to the layman to determine the need for such care. If every person were examined each year, the earliest signs of disease would be detected; it would be possible to recommend the early treatment which always offers the best chance for cure. If not for actual cure, at least the arrest of the progress of the condition. Many mothers understand this, and infants are taken to private physicians and to well-baby clinics when they are apparently well. In schools, the well child is examined. This is, of course, what the adult should do. When well, try to keep well!

Even at the present time, with all the general information that has been disseminated, the percentage of tuberculosis cases who come to their physician with the disease well-advanced is appalling. The cancer case loses his chance of cure because he has waited to decide that he needs medical advice. The heart case, because of delay in securing advice, loses the chance of early care which would permit, in many instances, of his leading a full, if somewhat restricted, life. There is a great deal of truth in the observation that the man who lives longest is the one who, early in life, discovers that he has some abnormality, and so lives a careful, hygienic life. Is it not reasonable to say that during the period when proper treatment offers so much the oppor-

tunity for revealing the need for such treatment should not be lost, and is it not rather absurd to ask the layman to decide upon the need for treatment during the early period of disease, when it is most difficult to diagnose?

The discovery of defects or of early disease is, however, the lesser value of periodic health examinations. Although a large percentage of apparently well individuals will be found with physical defects that require treatment, with early symptoms of disease whose cure or arrest depends upon prompt action, it is the need for advice concerning the maintenance of health that is the more important point. There are very few who do not need personal advice in the matter of diet, exercise, rest and relaxation, elimination, and other phases of personal hygiene. There are few who might not have better health than they now possess. We are all different, and just what one needs, what another neglects, and what still another abuses, are the things that must be discovered and regarding which advice must be given. This type of advice needs behind it the same scientific knowledge and thought as does the prescribing of remedies for the acutely ill.

The family physician, because of his knowledge of economic, social, and home conditions, and because confidence is reposed in him, is the best qualified for this service.

Amongst limited groups of adults, the need for, and the results of, periodic examinations have been proved. Life Insurance Companies have found it good business to pay for such examinations for their policy-holders. The opportunity is open to all to safeguard their lives, to attain greater efficiency, by securing for themselves a periodic health examination.

Make periodic health examinations an axiom of your lives!

Anti-Mouth-Breathing Mask.—This is a device for keeping the mouth closed after operations for producing an adequate airway. A wax impression is taken of the lower half of the patient's face. From this a cast is made. From the cast a thin metal mask is modelled. This fits accurately the lower half of patient's face from the lower margin of the anterior nares to below the chin. Suitable holes are drilled in the metal. These

enable a lint lining to be tacked on and two thin elastic bands attached. The mask is held in position by these elastic bands, which are fixed to a head band of stout webbing by means of "hooks and eyes". The mask has been used by exhibitor for the past six years and found very efficient.—T. B. Jobson, M.D., *Proc. Roy. Soc. Med.*, 1928, xxi, 1798.

SMALLPOX VACCINATION*

BY R. D. DEFRIES, M.D., D.P.H., AND N. E. MCKINNON, M.B.,

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IN 1796 Edward Jenner introduced the practice of vaccination. His first vaccination consisted in rubbing into a tiny scratch on the arm of an eight-year old boy a little cow-pox material, taken from a vesicle on the hand of a dairymaid who had contracted the disease in milking cows suffering from cow-pox. In the widespread use of vaccination which followed, several methods for obtaining supplies of vaccine were employed. The most popular, which continued in general use until practically the close of the nineteenth century, was to collect the vaccine from the arm of a previously vaccinated person at the time that the vesicle was well developed. To provide for emergency supplies, crusts from previous vaccination lesions were collected and stored. These methods of "arm to arm" vaccination, although efficient, were open to serious criticism. (Some of the common objections to vaccination as raised by anti-vaccinationists to-day are based on these old practices; these persons continue to reiterate the possibility of transmitting disease by vaccination, but such a danger existed only when the old methods were employed). Later, calves were used to propagate the virus and the vaccination of children in large numbers at one time was made possible in special stations provided for this purpose. In these stations the vaccinations were performed by the direct transfer of the vaccine from the vaccinated calf to the arms of the children.

Negri in 1842, instead of inoculating cows with vaccine material collected from human beings, inoculated cows with natural cow-pox and transferred the vaccine from cow to cow in series. By 1865 vaccine was produced by animal vaccination in a number of countries but this method was not employed in England until 1881. Following the findings of English Royal Commission in 1896, "arm to arm" vaccination was replaced officially by the use of "bovine" vaccine. In addition to direct vaccination from the

vaccinated areas in cows, the "lymph," so-called, was preserved by drying on small pieces of wood, bone or celluloid, which afforded a convenient means for distribution. The preparation of these "vaccine points" consisted simply of rupturing the vesicles, after a superficial cleansing of the surface, and, by means of a small brush, transferring the vesicle contents to the "points" of bone, wood or celluloid. After drying, the points were ready for distribution. Obviously no bacteriological control could be exercised on vaccine prepared in this manner and the method was subject to this criticism. In 1891 Copeman made a most important advance in the preparation of vaccine by establishing the use of glycerin as a diluent. This permitted not only of much greater production, as the lesions of the calf could be scraped thoroughly and the collected pulp ground in glycerin, but also of bacteriological control of vaccine. It was shown that glycerin serves as a good preservative of the virus and at the same time, in the course of some weeks, destroys extraneous bacteria. With its use, vaccine could be kept until bacteriological examination showed it to be free from pathogenic organisms. At the same time sterile glass capillary tubes as containers for the glycerinated vaccine were introduced into general use. During the following years other antiseptics, including phenol, have been found to be of additional value in the preparation of vaccine.

Extensive bacteriological studies have been made during recent years of the glycerinated vaccine and tests have been established which ensure to physicians vaccine, not only free from all pathogenic bacteria, but at the same time of high potency.

PREPARATION OF VACCINE VIRUS

Vaccine virus is prepared now in commercial quantities by the use of healthy calves, which are carefully selected and are kept under observation for eight days before being vaccinated. Tuberculin testing is carried out as a routine measure during this period of observa-

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tion and every precaution is taken to make sure that only healthy calves are used.

The calf vaccination is performed in the following manner. First, the calf is clipped and the whole body is cleaned by scrubbing with warm water and soap. It is then placed on a suitable table in such a position that the entire abdominal area and inner side of the thighs are exposed. These areas are prepared for vaccination by shaving off the hair and thoroughly cleansing the skin with soap and hot water followed by washing with sterile water, drying, and the application of 95 per cent alcohol to the entire surface. The surgically clean skin is protected at once by sterile towels. The area is further protected from contamination by covering all other parts of the body of the calf, including the legs, with clean cotton. At this stage the calf is moved into an adjoining room which may be spoken of as the operating room and in which the actual vaccination is performed. This consists of making a series of light scratches as close together as possible over the whole abdominal area and inner side of the thighs. It is important that the scratches should not be made deep enough to draw blood. As in human vaccination, the best results are obtained if the scratches are lightly made and just sufficient to break the skin. Vaccine virus is now applied and rubbed into the scratches by using a smooth instrument, such as an ordinary ebonite spatula. The vaccine used is usually spoken of as "seed"* vaccine and it is appreciated that special care must be exercised in its preparation.

After vaccinating, the area is protected until the surface is thoroughly dried and the calf is then placed in a special stall or room where it is kept scrupulously clean, excreta being at once removed and every precaution taken to prevent the contamination of the vaccinated area. In the Connaught Laboratories, it has been found of advantage to spray the vaccinated area daily with a 1 in 500 solution of brilliant green. When the vaccine vesicles are fully developed, usually in six days, the calf is washed, then chloroformed and exsanguin-

ated. The vaccinated area is repeatedly washed with warm water until the superficial crust material is softened and entirely removed. This is an essential step in the preparation of a vaccine of low bacterial content. The pulp, so called, is now removed by using a spoon curette. A post-mortem examination is made of each calf and if evidence of any disease is found the pulp is discarded. The next step consists in emulsifying this pulp by grinding with a 50 per cent solution of sterile glycerin containing 0.5 per cent of phenol, in the proportion of one part of pulp to four parts of glycerin-phenol solution. The emulsified pulp, or as it can now be called, glycerinized vaccine, is stored at about zero, centigrade, until distributed. During this time potency tests are completed. This period of "ripening" requires usually from one to two months.

During this period bacteriological counts are made at regular intervals and if the vaccine has been prepared under proper conditions, the bacterial count rapidly falls. Tests are made to detect the possible presence of tetanus or of any other pathogenic bacteria. These tests are made by suitable methods of culture of the vaccine emulsion and by inoculation of guinea pigs, both with broth cultures and with the vaccine emulsion itself. As a result of the action of the glycerin and phenol during the period of storage, in a vaccine which has been propagated and collected under proper conditions, the contaminating bacteria are so reduced in number that often several capillary tubes must be cultured before the presence of a single organism is shown.

It is essential also that the potency of the vaccine be carefully determined, not only before it is distributed, but at regular intervals for a period of three months after its distribution, during which time, if kept in a refrigerator, the vaccine should give satisfactory results. If evidence is found in the laboratory that the vaccine so stored is becoming inert the vaccine is recalled. The potency of the vaccine is determined by vaccinating rabbits with various dilutions. A vaccine giving a good "take" (a strong confluent reaction) when diluted with saline in the proportion of 1 part of vaccine to 250 parts of saline is considered to be of satisfactory potency. Confirmatory evidence may be obtained by observ-

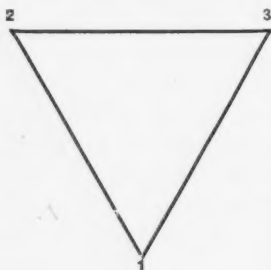
* In reference to the source of the seed virus used on this continent, Dr. W. H. Park, Director of the Bureau of Laboratories, Department of Health, New York City, has stated that it is probable that this virus is the strain originally brought to America in 1874 from the Vaccine Establishment of the Local Government Board of Great Britain.

The best site for vaccination is the arm above the insertion of the deltoid muscle, because this

part can be most conveniently kept clean, dry, and at rest, and is not liable to injury or irritation. These conditions are not obtained as readily on the leg which, as a vaccination site, has other disadvantages in its circulation and lymph drainage.

Numerous modifications of the established methods have been suggested during the past few years. These methods have the common objective of reducing to a minimum the amount of trauma in vaccinating, and, by so doing, avoiding unnecessary reaction with the formation of large scars. The methods outlined below are representative of the modern technique and are widely used.

The Short Scratch.—Cleanse the site with soap and water, alcohol, or ether, and allow it to dry thoroughly. Using a sterile needle, make three short scratches from $1/16$ to $1/8$ of an inch in length, about the size of the printed comma on this page, the scratches separated from each other by $1\frac{1}{2}$ inches.



These three scratches are most conveniently arranged at the points of a triangle as shown in the accompanying diagram. Wipe the capillary tube of vaccine with an alcohol swab and allow it to dry. Break

off both tips without contaminating the broken ends of the main portion, and push one end into the rubber bulb until the diaphragm within the bulb is punctured. Expel the vaccine on the two upper scratches (2, 3). One capillary tube contains enough vaccine for both. Gently rub the vaccine into the two scratches with the side of the needle. Allow sufficient time for the vaccine to dry. The lower scratch serves as a "control," the value of which will be appreciated in interpreting the vaccination reactions.

The Puncture Method.—Cleanse the site as previously described. Holding the sterile needle parallel to the arm, push the point into the skin for a distance of about $1/16$ inch, at a point on the arm corresponding to the lower angle of the triangle as indicated in the diagram. This is the "control puncture." Now, on the sites on the arm corresponding to the two upper angles (2 and 3) of the triangle in the diagram,

place a drop of vaccine. Holding the needle parallel as before, push the point through each drop into the skin for a distance of about $1/16$ of an inch. It is essential that the needle be held practically parallel and not at right angles to the arm, and that the point of the needle enter just between the skin layers. The vaccine may now be wiped off. Some vaccinators prefer to make two or more punctures through a single drop.

The method of using a short scratch ($1/16$ inch) at one place and a puncture at another, separated by one and one-half inches, has been found a very useful combination. Controls for each should be made first.

The question may be asked as to the reason for recommending that two vaccinations be made as a routine procedure either by scratch or puncture, or one scratch and one puncture. The answer to this is that failure to "take" is more often reported when only one scratch, or more particularly when one puncture, has been used. Failures in vaccination are due often to the vaccine being of a reduced potency or actually inert as a result of prolonged storage or exposure to heat in transportation. To overcome this possibility of failure it is wise to make two vaccinations, as the chance of failure is reduced and the probability of a successful take is increased. The arm of an infant, on account of its small size, should usually be subjected to one vaccination only. Revaccination should always be performed by vaccination in two areas. Especially is this important at times of an epidemic.

The short scratch method gives a very high percentage of "takes," the local reaction is of minimum size, and the final scar does not exceed $1/4$ of an inch in diameter. By making two scratches sufficiently far apart, the two lesions do not coalesce even in primary vaccinations and the healing proceeds as quickly as if only one area had been vaccinated. In making the scratch before the application of the vaccine, the vaccinator is able to control better its length and depth. This is a distinct advantage. Objections which are sometimes raised to this method are due to the lack of appreciation of the actual size of the scratch described, namely, $1/16$ to $1/8$ of an inch in length. Thus, the measurement of scratches supposed to be of the proper size shows that

these are often from 1/4 to 1/2 of an inch in length.

The puncture method gives a reaction and final scar very similar to that of the short scratch. It has not given, however, in our experience, as high a percentage of takes. An increased percentage of takes is obtained by making two or more punctures through a single drop, (that is, the multiple puncture method) but this increases, too, the size of the individual reaction and thereby defeats an aim of modern technique, namely, to have a minimum reaction. The occasional failure with the single puncture method is due either to the fact that the needle point has not satisfactorily entered the skin or that the virus used was of reduced potency. When a fully potent vaccine is used, single puncture vaccination will probably give as high a percentage of takes in primary vaccinations as a short scratch. As vaccine, however, is often of reduced potency due to storage and untoward conditions, it is evident that a higher percentage of takes may occur with the scratch method as this method offers an opportunity for more virus to enter.

The puncture method elicits better an "immediate" reaction on re-vaccinations. This will be discussed later. For these reasons there are advantages in vaccinating by a short scratch in one area and by a puncture in a second area, separating the two vaccinations by 1½ inches. The two small individual lesions, even in primary vaccinations, give rise to no more general reaction than does one, and, as has been said, do not coalesce but heal as quickly as one small area and much more quickly than a large area.

AFTER CARE

The essentials in the after care of vaccination are that the area be kept clean and dry and that there be no interference with the circulation or with the normal evaporation from the area. Anything which interferes even in the slightest degree with either of these produces conditions favourable to secondary infection. The best condition is therefore obtained when no dressing is used. Even clean gauze, pinned on the inner surface of the sleeve, if not actually required, may serve only as a source of irritation. In cases where the vaccination cannot be kept clean without a

dressing, a sterile gauze dressing may be applied loosely to the arm. Adhesive plaster or shields of any description, should be sedulously avoided. Clinical and experimental investigation has shown that the vaccination lesions under such dressings, due to interference with the circulation and evaporation, tend to increase to the whole size of the area covered and conditions become ideal for secondary infection. Even when adhesive is employed to fasten gauze, only narrow strips should be used to fasten the corners of the dressing. These should be placed diagonally across the arm, rather than around it, and at some distance from the vaccination. If the lesion ruptures and serum exudes, sterile gauze should be applied to the site with the precautions indicated. Complete rest is indicated when there is fever, headache, malaise, or other symptoms of a general reaction.

VACCINE REACTIONS AND THEIR INTERPRETATION

In addition to the characteristic "take" following vaccination two other reactions are recognized following re-vaccination. These two reactions have been described as the immediate reaction or the reaction of immunity, and the accelerated or vaccinoid reaction. One of the underlying factors which determines the character of the reaction following re-vaccination is the degree of immunity possessed by an individual. It is obvious that the previous history of an individual regarding successful vaccination or smallpox should be taken into consideration in interpreting the reactions. A primary vaccination, if successful, results in a typical take. A re-vaccination, if successful, shows one of four reactions which can be classified according to the time when the lesion reaches the height of its development. The possible reactions are: (a) A typical "take" as in a primary vaccination. (b) An immediate reaction. (c) An accelerated reaction. (d) A combination of (b) with either (a) or (c).

Typical "Take".—A typical "take" is the only type of reaction which results from a primary vaccination. It may, however, occur after re-vaccination in individuals who have lost their immunity. The examination of the vaccinated area within forty-eight hours shows no evidence of a reaction beyond that seen on the control scratch or puncture. On the third

day slight redness can usually be seen at the vaccination site. On the fourth day a small papule is evident and the redness is more definite. On the fifth day, or occasionally earlier, the papule has changed to a small shallow vesicle surrounded by a narrow but clearly defined red zone, the primary areola. During the following days the vesicle increases in size, the contents become more turbid and a central depression, which appeared early, shows commencing crust formation. Between the eighth and the twelfth days, a second zone of redness appears outside the primary areola and remains in evidence for some part of a day. Though larger, it is much less clearly defined than the primary areola. This zone, spoken of as the secondary areola, marks the height of the reaction. Practically coinciding with the development of this secondary areola, a general reaction frequently occurs in adults and older children, as shown by fever, malaise and headache. The axillary glands are palpable and tender. (During this time the patient should be in bed.) The absence of any general reaction in infants is a very strong point in favour of infant vaccination. Following the fading of the secondary areola, the lesion rapidly retrogresses, being covered with a dry crust. In about two weeks' time the crust falls off leaving a depressed scar. If a typical "take" does not occur the correct procedure is to repeat the vaccination with fresh virus, and, if this fails, to repeat the vaccination a third or even a fourth time. Complete natural immunity is very rare. For cases which prove repeatedly resistant to vaccination, as performed either by the scratch or puncture method, intradermal vaccination may be used. In this method, the contents of one capillary tube of vaccine virus are expelled into the barrel of a 1 c.c. syringe. The plunger is inserted and 0.5 c.c. of sterile saline is drawn into the syringe. The vaccine material is thoroughly mixed with the saline by shaking and an injection of 0.1 c.c. is then made intradermally. The reaction which follows is a typical "take" and the resultant scar is about 1/4 of an inch in diameter.

Immediate Reaction.—The immediate reaction is seen only in persons previously successfully vaccinated or in those who have had smallpox. It is characterized by the formation within

twenty-four hours of the time of vaccinating of a definite red papule accompanied by itching. This reaction reaches its full development within seventy-two hours and rapidly retrogresses. It never develops into a vesicle but quickly resolves from the papule stage. Comparison of the vaccinated site with the control scratch or puncture is essential in interpreting this reaction. The reaction is generally larger and more definite when re-vaccination is performed by the puncture method than by the scratch method. It is usually interpreted to mean that the individual has a satisfactory immunity to smallpox, but too great reliance must not be placed on this interpretation. It has been found that occasionally a person may give an immediate reaction which is later followed by the development of a vesicle, indicating that the individual did not possess as high a degree of immunity as would be interpreted from an early reading of the reaction. A more important point in this connection is the fact that dead or inert virus can elicit immediate reactions in persons previously vaccinated or in those who have had smallpox. In this lies a danger that immediate reactions, elicited by virus inert or incapable of producing a typical "take," may be interpreted to mean that the individual is immune to smallpox, thus giving a false sense of security. If potent virus had been used in these persons, reactions approaching a typical "take" might have been obtained.

The Accelerated Reaction.—The accelerated reaction is seen in individuals who have lost some of the immunity induced by a previous successful vaccination or by an attack of smallpox. Beginning before the fourth day, this reaction progresses further than the papule of the immediate reaction and may pass through the vesicle, pustule and crust stages, occasionally resulting in a small scar. It reaches its height after the third day, but before the tenth day. It may vary, therefore, in its character and the time of development, from a reaction closely resembling an immediate reaction, to one closely resembling a typical "take." Its progress through all the stages however, is rapid and the lesion seldom reaches the size of a typical "take." In many instances the lesion of an accelerated reaction is drying before a typical "take" would have reached its height. This

reaction is seen, as stated, in individuals who have been previously successfully vaccinated or have suffered an attack of smallpox and who, through the lapse of time, have lost a part of their immunity. It indicates, therefore, a lessened immunity.

Although the more or less arbitrary time limits given here cannot be applied exactly to every case, there is little difficulty in placing observed reactions in one of these classes. As the immediate reaction may reach its height before the third day, it is necessary that observation of a re-vaccination should be made about the second or third day. A second observation of the site should be made about the sixth day when the presence of an accelerated reaction or a typical take may be recognized. The absence of any reaction following a re-vaccination requires that the procedure be repeated with known potent vaccine. The vast majority of "no reactions" following re-vaccination, however, are due to lack of observation at the proper time, rather than to the lack of the occurrence of reaction.

COMPLICATIONS

Complications are of rare occurrence if the modern methods of vaccinating are employed and the vaccinated area is kept clean and dry, shields and other unnecessary coverings being avoided. Armstrong, in a study of experimentally induced infection of vaccinations in monkeys, has shown conclusively that shields and other coverings produced conditions favouring secondary infection, and that, when tetanus spores were added to the vaccine used, tetanus developed only in the monkeys which had the vaccinated areas covered. To our knowledge, no authenticated case of tetanus following vaccination has ever been reported in Canada. Other complications, such as impetigo, the transfer of vaccine to other parts of the body, cellulitis and erysipelas, are of rare occurrence, as shown by the extensive experience during recent years of many public health officers in Canada. Encephalitis following vaccination has been described in other countries, but in spite of extensive investigation, the claim that the vaccine was the cause has not been substantiated.

HOW TO KEEP VACCINE VIRUS

Vaccine virus must be kept in a well-iced refrigerator. Studies have shown that even at the temperature of a "cold" cellar or in a "cool" window vaccine virus rapidly loses its potency. Failures in vaccination and the necessity for repeating the procedure are for the most part due to weak or inert vaccine. As the vaccine is carefully tested and is known to be of satisfactory potency when it is sent out from the laboratory, it follows that the loss of potency must be caused by exposure to heat either in transit, in the drug store, or in the physician's office. To protect the vaccine when it is sent in quantity, special refrigerator boxes, which are kept filled with ice by the express companies, are used for shipping. A few packages, however, sent to a physician cannot be so protected in the mails and in consequence the vaccine may be rendered completely inert by contact of the mail bag with steam pipes or other sources of heat in the winter or by exposure to the heat of summer. A potent vaccine should give successful results in at least 90 per cent of primary vaccinations. The obtaining of a smaller percentage of "takes" in primary vaccinations should be sufficient warning to the physician that the vaccine was not fully potent, and it should be appreciated that the failure to "take" was not due to any natural immunity, but to weakness of the vaccine. In this connection it should be remembered that even "dead" virus may elicit immediate reactions in re-vaccination where typical "takes" or accelerated reactions might occur if the virus were fully potent. The use of weak virus may, as stated, give rise to serious error in the interpretation of the immunity status of individuals. If the vaccine cannot be kept in a well-iced refrigerator, it is desirable that fresh supplies be obtained as required from time to time for immediate needs only, rather than that vaccine be used which has been kept for even a few weeks under less favorable conditions.

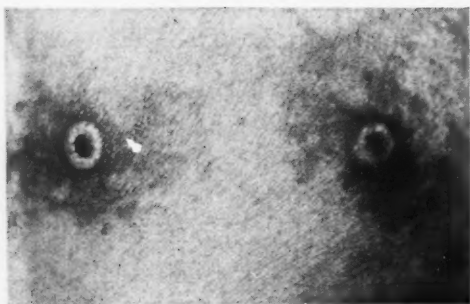
VACCINATION CERTIFICATE

A vaccination certificate to be of any value should state the day on which the vaccination was performed, the day on which the vaccination was observed, and the character of the reaction, whether a primary "take", an immediate reaction or an accelerated reaction. A less complete statement leaves room for serious error. The

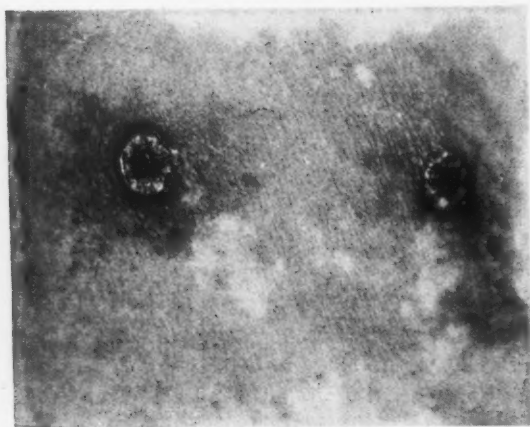
PLATE I.—TYPICAL "TAKE"



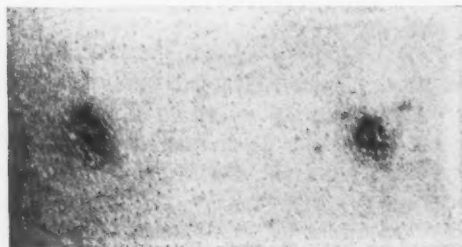
4 Days



8 Days

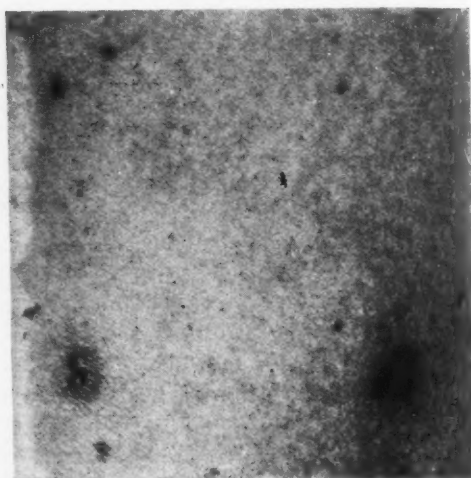


10 Days



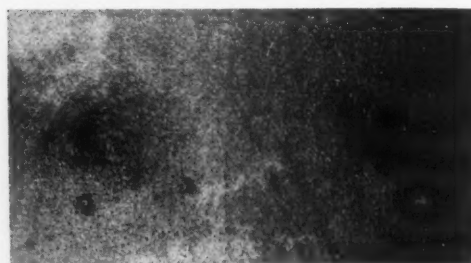
2 Months

PLATE II.—IMMEDIATE REACTION

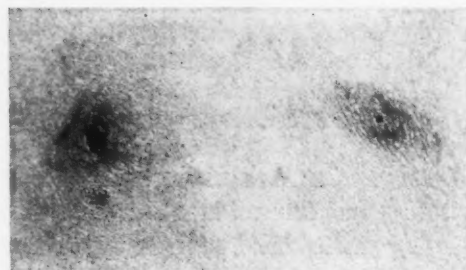


48 Hours

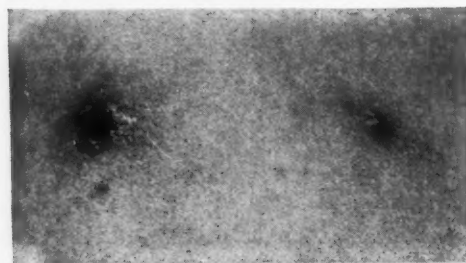
PLATE III.—ACCELERATED REACTION



4 Days



5 Days



8 Days

VACCINATION CERTIFICATE

Date.....

This is to certify that I have vaccinated the bearer

..... on
Date

Typical take

Immediate reaction was observed on

Accelerated reaction Date

Signature of Person

Signature of Physician

Address.....

certificate should bear the signature of the person vaccinated in order that quarantine officers or other persons interested may have some means of proving that the bearer of the certificate is the person to whom the certificate was originally issued. Comparison of the bearer's signature with that on the certificate is used for this purpose. A copy of a suitable certificate is given herewith.

CONCLUSIONS

1. Modern methods of preparation of vaccine virus assure a product of high potency and freedom from all pathogenic organisms.
2. Modern methods of vaccination eliminate severe reactions and large scars.
3. The short scratch method, the puncture method, or a combination of these is advocated.
4. Shields or other unnecessary coverings are a source of danger.
5. Primary vaccination should be observed about the seventh day. Re-vaccination should be observed about the second or third day, and again about the fifth or sixth day.
6. Temperatures higher than that of a refrigerator are destructive to vaccine virus, and the use of virus not kept in an ice-box may lead to error.
7. A vaccination certificate should state specifically the type of reaction observed.

DESCRIPTION OF PLATES (See page 532)

In these plates the vaccinations shown have been performed by the short scratch method and by the single puncture method for the purposes of comparison of the resultant lesions. In each instance the short scratch vaccination appears on the left of the picture and the single puncture vaccination on the right hand side.

PLATE I shows photographs of approximately actual size of a typical "take" in an adult. On the fourth day the small though definite vesicle is to be noticed. By the eighth day the vesicle has increased, surrounded by a definite primary areola. In the centre of the vesicle a crust has formed. The picture of the tenth day shows the reaction at its height. The indefinite, large secondary areola is well shown. The picture taken two months after vaccination shows the actual size of the final scar. Little difference is noted in the development of the lesions produced by the two methods of vaccination employed.

PLATE II shows the actual size of an immediate reaction in an adult with a history of a previous successful vaccination and re-vaccination. The reaction following the puncture vaccination (right hand side) is somewhat larger and more definite than that produced by the short scratch vaccination, illustrating the observation made in the text. The control scratch and puncture can just be seen about an inch above and corresponding to the reactions. The contrast between the reactions and the control is readily seen.

PLATE III shows an accelerated reaction. On the fourth day the puncture lesion is slightly more in evidence than the scratch lesion. By the fifth day more reaction has occurred on the scratch vaccination and there is evidence of some vesicle formation. The eighth day shows both lesions larger but already drying, in contrast to the growing vesicle of the primary "take" on the same day.

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PERIARTERITIS NODOSA*

WITH THE REPORT OF A CASE

By G. F. STRONG, M.D.,

Vancouver

AT the present time periarteritis nodosa is one of the clinical rarities of medicine. First mentioned by Rokitsansky in 1852, the name and first accurate description of this disorder were given by Kussmaul and Maier in 1866. Since that time there has been a slow accumulation of authentic cases. In the first forty-two years, to 1908, only twenty-six instances of this peculiar disease were reported,¹ whereas in the last twenty years one hundred and sixteen cases, including the present report, have appeared. This increasing incidence may indicate a greater interest in the disease and a more careful study of autopsy material rather than any actual increase in the incidence of periarteritis nodosa.

Of the total one hundred and forty-two cases only twenty-one have been reported in English; six from England, one from Australia, thirteen from the United States, and this one from Canada, most of the others occurring in Germany and Central Europe. Whether this greater incidence in that part of Europe is due to any racial or geographical factor, or whether it is due to an increased interest in the study of this peculiar arterial disorder it is impossible to say. The larger percentage of autopsies obtained in some of the continental clinics may influence the finding of this disease which, in nearly every case, is diagnosed only post mortem and frequently only after examination of the microscopical sections.

CASE REPORT

Mrs. B., housewife, aged forty-six years, was seen on March 29, 1928, complaining of recurring attacks of severe abdominal pain accompanied by nausea and vomiting; progressive loss of weight and strength; pain and weakness in left forearm and hand; and pruritus.

Present illness.—In the late summer of 1926 patient had influenza and from that time had never been well. She had felt run down and complained of occasional asthmatic attacks. In July, 1927, the patient was advised to leave Ontario and come to Vancouver for her health. It was about this time that the

present symptoms were first noted, and they have persisted with gradually increasing severity. She had consulted numerous doctors without relief, the diagnosis being usually neurasthenia. Because of the persisting abdominal pain attention was directed chiefly to the gastro-intestinal tract and gall bladder, repeated x-ray examinations of which were negative.

In March, 1928, the patient consulted a gynecologist, Dr. J. J. Mason, who, in the course of his examination, had the blood examined. The count showed red blood cells 5,000,000; hæmoglobin 80 per cent; white blood cells 32,000; polymorphonuclears 19 per cent, lymphocytes 10 per cent, monocytes 1 per cent, eosinophiles 70 per cent. The blood Wassermann was negative. Because of this unusual white cell count the patient was then referred to me for further study.

Past history.—The patient was born in Ontario where she had always lived until coming to British Columbia. No significant previous illnesses. Tonsillectomy in 1926. Married three years, no pregnancies; catamenia regular.

Family history.—Nothing relevant.

Physical examination. (March 29, 1928).—The patient was acutely ill and showed obvious signs of loss of weight and strength. She was pale, with definite puffiness of the eyelids. There were numerous scratch marks on her skin and pruritus was a troublesome symptom. On the outer aspect of the lower third of her left leg was an irregular purpuric area several inches in diameter, undoubtedly aggravated by scratching. On both forearms, but more noticeable on the right, were a few small pea-sized non-tender subcutaneous nodules. Examination of her mouth, teeth and throat was negative. There were no enlarged lymph-nodes. The thyroid was not enlarged. The pulse was 108, small and regular. The peripheral vessels, temporal, brachial and radial, all showed palpable sclerosis with beading and increased tortuosity. Blood pressure was systolic 160, diastolic 100. Temperature, 99°. The heart and lungs were normal. The abdomen was slightly distended; no rigidity, no free fluid. The liver was enlarged, extending from the fourth rib to three to four fingers' breadths below the costal margin in the mid-clavicular line; not tender. The spleen was not palpable and the area of splenic dullness not increased. Pelvis normal. Nervous system: the pupils reacted well to light and accommodation; no involvement of the cranial nerves; reflexes were normal; and there was no disturbance of sensation. There was slight weakness of the grip on the left side, with slight atrophy of the small muscles of that hand.

Diagnosis.—The tentative diagnosis at this time was trichinosis or intestinal parasites. The diagnosis of parasitic infestation was based largely on the eosinophilia, and the subcutaneous nodules suggested trichinosis. The patient was sent to the Vancouver General Hospital for further examination.

First admission. (March 30, 1928, to April 14, 1928).—The temperature varied from 97° to 100.8°, and the pulse from 90 to 130, usually above 100. Respirations were normal. Patient complained of severe abdominal pains coming on in attacks at irregular intervals and associated with nausea and vomiting. These pains were so severe as to require morphine (grain ¼

* Presented at a meeting of the North Pacific Society of Internal Medicine, Vancouver, September 8, 1928.

hypodermically) for relief. Patient also complained of extreme general weakness, indefinite muscle pains, and pain and numbness in left hand and forearm. The abdominal symptoms had disappeared by April 6th, and the patient then began to feel better and was able to be up about the ward April 10th and to go home on the 14th. The purpuric area on the left leg had disappeared. Examination of eye grounds showed slight blurring of both discs and some peri-papillary oedema. The arteries were definitely sclerotic, showing irregularity of the lumen, increased tortuosity, and increased refractility. The veins appeared normal. There were no haemorrhages and no exudate. On April 5th one of the small subcutaneous nodules was excised from the dorsal side of the right forearm near the elbow, and was found to consist of a grayish-white homogeneous mass 2 mm. in diameter. It was examined microscopically for trichina but there was no evidence of this parasite. The nodule was found to consist of a fibrosis surrounding a

moderately large vessel, (Fig. 1). No eosinophiles were noted in the surrounding infiltration. The right forearm was x-rayed because one nodule was attached to the ulna, but the result was negative. X-ray examination of the chest showed the heart and lungs to be normal, though the right diaphragm was elevated (enlarged liver). Repeated examinations of the stools for parasites were negative. For the blood count see Table I. Urinalysis was normal.

*Second admission, (April 24 to 26, 1928).—*Temperature, 98° to 98.6°; pulse, 90 to 120; respirations, 20. The patient re-entered hospital for further study. Her symptoms were increasing weakness, recurring abdominal distress, and increasing pain and weakness of both hands, more especially the left. The physical examination was similar to that on March 29th. The examination of the stools was again negative for parasites. For the blood count see Table I. While no definite diagnosis was attempted at this time, the following possibilities were considered: parasitic disease, in spite of negative stool examinations, and the absence of signs of trichina in the excised nodule; leukaemia, because of the obviously progressive character of her illness, the extreme weakness and the unusual leucocyte count; and intra-abdominal disease because of the persisting abdominal symptoms.

*Third admission, (May 15 to 26, 1928).—*The patient was complaining of asthmatic attacks, debility, increasing weakness of both arms and hands, and recurring attacks of abdominal pain. Temperature was 97° to 105° (terminal pneumonia); pulse, 100 to 140; respirations, 20 to 30. The presence of an indefinite mass in the right abdomen (in addition to the enlarged liver), and the persistence of the abdominal pain, seemed to warrant further investigation. A barium enema showed a normal colon. Blood Wassermann again negative. Non-protein nitrogen, 36 mg. Urine, acid, specific gravity 1019, albumen a trace, sugar negative, red blood cells and hyaline casts present. For the blood count see Table I. The trace of albumen and red blood cells in the urine, the recurring abdominal pain, and the indefinite mass in the right upper quadrant suggested the possibility of right kidney involvement. Cystoscopy and pyelography on May 21st revealed normal



FIG. 1.—Subcutaneous nodule excised on April 5th. Note the marked fibrosis surrounding the small vessel in the centre of the nodule.

TABLE I.

Date 1928	Red Blood Cells in Millions	Hemoglobin Per Cent	Colour Index	Staining	White Blood Cells	Polymorphonuclears	Lymphocytes	Monocytes	Eosinophiles	Number of cells Counted	Remarks
March 15	5.0	80	0.8	good	32,000	19	10	1	70	200	
March 31					31,200	11	9	1	79	200	Severe abdominal pain and vomiting.
April 9					18,600	41	11	4	44	200	Remission.
April 24					32,000	17	7		76	150	Recurrence of abdominal pain and vomiting.
May 16	4.5	90	1.0	Irreg.	21,000	58	5	3	34	100	Increasing evidence of peripheral neuritis. Progressive weakness.
May 23					16,000	71	19	3	7	200	Acute pleurisy and pneumonia at the right base.

kidneys and ureters, though the bladder was trabeculated. On May 24th the patient took a sudden chill and complained of severe pain in right lower chest. On May 25th there was evidence of right-sided pneumonia and pleurisy at the right base. Death occurred on May 26th from pneumonia.

AUTOPSY

The autopsy was performed by Dr. H. H. Pitts, pathologist to the Vancouver General Hospital, nine and one-half hours post mortem, and his report follows:

The body was that of a fairly well developed, poorly nourished, white female, forty-six years of age. Relatively little of note was apparent on external examination. The small subcutaneous nodules noted during life were still palpable on both forearms.

The right pleural cavity was partly filled with sero-fibrinous exudate which also covered the lung. The lung was compressed and practically the entire middle lobe was involved in a pneumonic process. The lung weighed 740 gm. The left lung was free in the pleural cavity, weighed 500 gm. and on section showed scattered bronchopneumonic areas. The pericardial sac was intact. The heart weighed 270 gm. The valves, coronaries, and aorta were all intact. No gross evidence of arteriosclerosis and no beading of the coronaries. The musculature was pale and rather friable. Mediastinal glands were hyperplastic and congested.

The examination of the abdominal cavity revealed a liver of about normal size, but of a rather flattened, elongated type, a definite Reidel's lobe projecting downwards almost to caecum. The liver weighed 1,390 gm. and on section presented a typical nutmeg appearance. No gross fibrosis was present. The gall bladder was intact and not particularly enlarged. The stomach was moderately distended but it and the duodenum were intact. The jejunum was intact, but in the lower three feet of the ileum three rather elongated superficial ulcerations were found, with little loss of tissue but some necrosis of the mucosa, no induration and considerable surrounding congestion. They appeared to be in the Peyer's patches. The large intestine was intact. The spleen weighed 125 gm. and showed little of note on section. The uterus, tubes, and ovaries were intact, except for two filbert-sized intramural fibroids in the first. The kidneys each weighed 165 gm. The capsules stripped fairly easily, except in one or two areas, leaving a peculiar mottled appearance, with grayish-white to yellow surface, and depressions of a more normal tissue running between elevated, more grayish-white, areas. On section, the cortex was seen to be of normal thickness, with the same rather mottled appearance presenting and with scattered small cortical abscesses. The pelvis seemed intact. The ureteral mucosa was slightly reddened and the bladder mucosa trabeculated and pale, except at the ureteral orifices where some congestion was apparent. The bone-marrow removed from one femur showed a reddish-yellow, fairly normal gross appearance.

In none of the vessels, namely the mesenteric, splenic or renal arteries, were there any evidences of aneurysmal dilatations nor of any particular gross thickening of the vessel walls.

Diagnosis: right lobar pneumonia and acute fibrinous pleurisy; left broncho-pneumonia; ulcerative enteritis (ileum); chronic degenerative nephritis; multiple abscesses of the kidneys; myocardial degeneration.

Microscopical findings. Heart: sections through the heart muscle showed the muscle fibres to be somewhat swollen, fairly closely packed; the cross and longitudinal striations rather poorly defined, nuclei only fairly distinct; Myocardial degeneration. The branches of the coronary artery showed considerable increase in the thickness of the walls, this increase being largely a fibrous replacement of the media and adventitia (Fig. 2).

Sections through the right middle lobe and pneumonic areas in the left lung showed all the alveoli to be

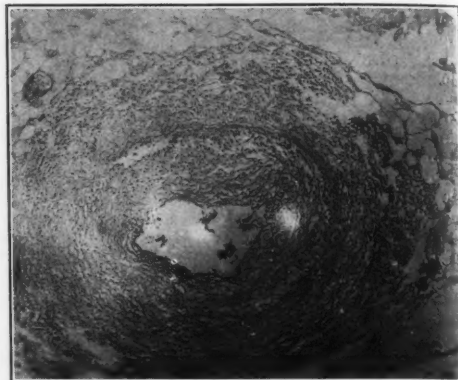


FIG. 2.—Branch of a coronary artery showing the great increase in the thickness of the walls, this increase being due to a fibrous tissue replacement.

completely filled with a cellular fibrinous exudate rich in polymorphonuclears, the blood vessels throughout being completely engorged and the alveoli airless; lobar and bronchial pneumonia. (No larger arteries were included in these sections.)

A number of sections were taken through the kidneys, some to include the small abscess-like formations. These were seen to show complete degeneration of the tubular structure in the involved areas, the lining epithelium being completely fashioned into an amorphous mass, the glomeruli being similarly involved, while vast numbers of inflammatory cells were seen infiltrated throughout. These areas were surrounded by a deep zone of congestion. The sections through the elevated whitish areas in the kidneys showed large collections of small round cells with areas of fibrosis, apparently conforming to these demarcations. This small round cell infiltration extended from these areas in a more diffuse but less abundant fashion throughout the whole kidney substance. The glomeruli themselves did not appear much involved, while throughout there was quite extensive congestion, the lining epithelium of the convoluted tubules being desquamated in many areas and, where present, appearing to be of a much lower type than normal. The fairly large branches of renal artery which were present in the sections of the kidneys showed considerable increase in the thickness of the walls, this increase being largely a fibrous replacement of the media and adventitia (Fig. 3). Chronic degenerative nephritis.

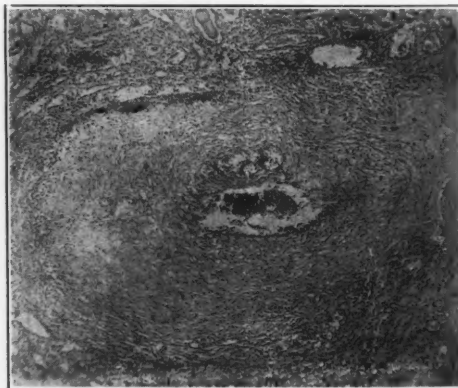


FIG. 3.—Branch of renal artery showing increased thickness of wall due to connective-tissue formation.

Sections through the liver showed an advanced stage of passive venous congestion, the central veins being deeply congested and the liver cells immediately surrounding and for a considerable distance around showing definitely atrophic changes, the whole having a very marked mottled appearance.

Several sections were taken through the ulcerated areas in the ileum but these only showed necrosis of the mucosa and, to some extent, the submucosa. Relatively little inflammatory cell infiltration was present, but well defined congestion of the vessels throughout. There were a number of fairly large submucosal vessels embodied in these sections which showed a condition of end-arteritis rather than periarteritis; it would seem as if there was almost complete occlusion of the lumina by organizing fibrous connective-tissue structure.

Sections through the spleen showed a moderate degree of passive venous congestion, but otherwise little of note beyond hypoplasia of the Malpighian corpuscles. The mediastinal glands also showed a very marked congestion, but otherwise there was little of note.

A number of sections were taken through the bone marrow and stained by various methods, but in none of these was there anything of particular note, certainly no evidence of increased eosinophile formation and no particularly abnormal cells. Several vessels present in these sections showed, as seen in other structures, definite thickening of the media and adventitia.

In an effort to establish a diagnosis in this case these sections were examined more particularly as regards the vascular channels and it was found in all that the larger vessels showed definite thickening of their walls (especially in the adventitia), many of these being increased approximately three or four times their normal thickness. This process held good only in the larger vessels; for instance, the small vessels forming the centre of the Malpighian corpuscles in the spleen showed no evidence of this fibrosis. There was only slight evidence of inflammatory cell infiltration within this fibrous connective-tissue formation or surrounding it. No eosinophiles were noted in the cellular exudate.

Sections were taken from the various organs and stained with a variety of stains, *i.e.*, van Gieson's Mallory's aniline blue, Unna's elastic tissue stain, and the two former showed well-defined connective-tissue increase in the walls, this connective-tissue formation being in both media and adventitia, but most marked in the latter. With the elastic tissue stain the elastic laminae were clearly defined and showed evidence of rupture, especially clear in those vessels with the greatest increase in connective-tissue formation (Fig. 4).

This was apparently a case of periarteritis nodosa.

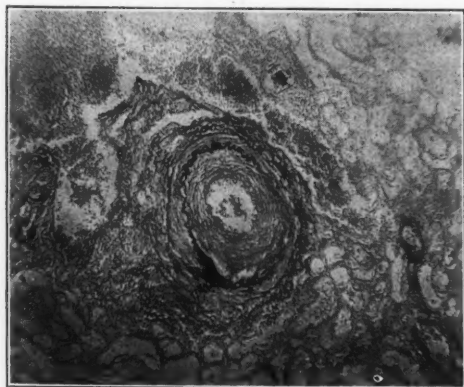


FIG. 4.—Smaller branch of renal artery stained with elastic tissue stain. This shows the elastic laminae. In this case the interna is definitely deficient in part.

The gross findings did not conform to those found in many other reported cases but the microscopic examination of the blood vessels seemed to point undoubtedly to a lesion of this type.

The splendid review of the subject of periarteritis nodosa published by Gruber in 1926² furnishes a summary of the authentic cases to that date. Twenty-four additional cases have been reported since that time. A tabulation of all cases of periarteritis nodosa to the present time follows:—

TABLE II

Author	Date of Report	No. of Cases
Gruber ²	1926	118
*Cleland ³	1923	1
Christeller ⁴	1926	4
Frommel ⁵	1926	1
Franz ⁶	1926	5
Gray ⁷	1926	1
Harbitz ⁸	1927	1
Singer ⁹	1927	2
Marinesco and Draganescu ¹⁰	1927	1
Battaglia ¹¹	1927	2
Bansi ¹²	1927	2
Giese ¹³	1927	1
Basch ¹⁴	1927	1
†Freund ¹⁵	1927	1
Strong (present report)	1928	1
Total	.....	142

Gruber's above mentioned review has made available in German a summary of the clinical and pathological findings. It may be of some value so to summarize the cases reported in English that further interest in this unusual disease may be stimulated on this continent. A brief resumé of each of these is therefore presented, together with a table of certain data of interest and value in the study of periarteritis nodosa.

SUMMARY OF CASES REPORTED IN ENGLISH

DICKSON:¹⁶ Messenger boy, fourteen years old. Initial complaints, cerebral symptoms. Febrile illness, convulsions. Diagnosis, tuberculous or pneumococcal meningitis. Duration of illness, fifteen weeks.

LONGSCOPE:¹ Coloured stevedore, aged thirty-five. Initial complaints, cardiac and arthritic. Widal repeatedly negative. Duration, eight weeks. Sudden death.

COOKE:¹⁷ Boy, aged nineteen. Initial complaints, pain in the calves of legs while standing or walking. Febrile illness. Duration, eleven weeks. Sudden death.

LEWIS:¹⁸ Plumber, aged thirty-three. Initial complaint, numbness and soreness of the hands. Febrile illness with irregular muscular pains. Loss of reflexes. Duration, ten weeks.

BEATTIE AND DOUGLAS:¹⁹ Cutler, nineteen years old. Diagnosis at first influenza, later typhoid fever. Duration, eight weeks.

* This case appears to have been overlooked by Gruber, yet it seems to be an authentic example of periarteritis nodosa.

† This case has not been verified.

LAMB:²⁰ Mechanic, aged twenty-six. Initial complaints, asthma, and an itchy, painful swelling about right ankle. Purpuric eruption all parts of the body except face. Severe abdominal cramps, joint pains. Diagnosis, purpura rheumatica. Duration, eleven weeks. Eosinophiles up to 51 per cent.

LAMB:²⁰ Girl, aged ten. Initial complaints, epigastric pain and vomiting, sore throat. Diagnosis, at first appendicitis. Appendectomy. Later, acute tonsillitis, acute nephritis, acute arthritis. Duration, nine weeks. Sudden death.

KLOTZ:²¹ Woman, music teacher, aged thirty-three. Initial complaints, abdominal pain, pain in muscles and joints, tenderness over gall bladder. Diagnosis, at first cholecystitis, possibly empyema of gall bladder; later, *streptococcus viridans* infection. Duration, four weeks. Sudden death resulted from rupture of a periarteritic nodule in the right lobe of the liver.

KLOTZ:²¹ Man, aged fifty-three, mail carrier. Initial complaints, general weakness and nocturia. Tonsillitis, purpuric nodules on legs and chest. Diagnosis of Wilson's disease (degeneration of the lenticular nucleus). Blood Wassermann ++++. Duration, eighteen months. Death resulted from hemorrhage into the peritoneum.

CAMERON AND LAIDLAW:²² Newspaper cyclist, aged twenty-seven. Initial complaints, severe abdominal pain, extreme weakness and loss of weight. Thickening of peripheral arteries. Periarteritic nodules. Febrile illness. Diagnosis, at first tuberculosis of vertebrae; later arteriosclerosis; later malignant gastric disease. Duration five months. † lues.

MANGES AND BAHR:²³ Man, aged thirty-nine. Complaints, recurring abdominal pain. Exploratory laparotomy. Periarteritic nodules in the mesentery. Microscopic examination of excised nodule revealed typical acute changes. Died four months after operation as a result of nephritis, with a terminal bronchopneumonia. Duration, six months.

HARRIS AND FRIEDRICH:²⁴ Coloured labourer, aged thirty-two. Initial complaints, weakness and abdominal pain. Later, pain in the region of right kidney. "Surgical abdomen." Duration, five and a half weeks.

CARLING AND HICKS:²⁵ Engineer, aged thirty. Initial complaints, severe pain and tender swelling in right calf. Provisional diagnosis, gummatous infiltration, possibly sarcoma. Exploratory incision showed "scattered nodules of a fibrotic nature about the smaller arteries." Microscopic examination of nodule showed typical periarteritic changes. Nodules also developed on both arms. Blood Wassermann ++++. Patient given intravenous injections of "salvarsan substitute" with apparent cure. Duration nine months.

OPHÜLS:²⁶ Persian, janitor, aged thirty-eight. Complaints, abdominal symptoms for which an appendectomy had been performed, asthma, ascites, hydrothorax. "Findings and the course of the disease were so unusual that the clinicians refused to make a diagnosis." Duration, eight months. Death from myocardial weakness.

WORDLEY:²⁷ Boy, aged thirteen. A case of cortical necrosis of the kidney. Hematuria, "fits," suppression of urine. The only visible macroscopic periarteritic nodules noted were in the coronary vessels. The kidneys showed microscopic evidence of typical changes of periarteritis nodosa. Duration, two months.

CLELAND:⁸ Man, aged eighteen years. Mechanic. Initial complaints, headache, abdominal pain. Febrile course with rapid emaciation. Evidence of involvement of the central nervous system. Diagnosis, typhoid fever, miliary tuberculosis. Duration, nine weeks.

KEEGAN:²⁸ Woman, drug addict, aged twenty-four, with persistent abdominal symptoms and pus cells in the urine. Exploratory laparotomy revealed no disease of the abdominal viscera. Right kidney was then explored and removed. Cross section showed numerous white miliary nodules, microscopic examination of which showed periarteritic changes. Patient died two months after

the operation as a result of cardiac insufficiency and pericarditis. Duration three months.

GRAY:⁷ School boy, aged twelve. Injury to left knee, resulting infection of left thigh. Febrile illness, with negative blood cultures. Local inflammation subsided at the end of a month, but patient's condition steadily deteriorated. Died from hemorrhage from a periarteritic aneurysm of the cystic artery. Duration, nine weeks.

SINGER:⁹ Coloured man, aged twenty-nine. Hypertension. Diagnosis, catarrhal jaundice and a diffuse syphilitic hepatitis, in addition to chronic nephritis. Cholecystectomy. Two and a half months later patient was re-admitted to hospital with evidence of myocardial insufficiency which resulted in his death. Arteries of the excised gall bladder showed changes suggestive of periarteritis. No autopsy was performed.

SINGER:⁹ Man, aged fifty-seven, with symptoms of decompensation. Hypertension. Diagnosis, chronic nephritis, with myocardial insufficiency. Re-admission: abdominal pain, definite signs of polyneuritis. Diagnosis, morbus incognitus. Autopsy revealed striking changes in the arteries of the walls of the gall bladder, in addition to changes in the vessels of the heart and kidney, typical of periarteritis nodosa.

GENERAL ANALYSIS

A statement of the prominent features of these twenty-one cases is presented in Table III. The paucity of clinical notes in some of these cases is an unfortunate result of the impossibility of making a diagnosis before autopsy. There are certain points in this table which should be emphasized. The temperature is practically always elevated; in only one of the twenty-one cases was it reported as normal. Leucocytosis nearly always occurs; in only one of the cases in which the white blood cells were counted were they found to be normal. The differential count usually reveals an increase in the polymorphonuclears, though in three cases, including the present one, an eosinophilia occurred. Urinalysis reveals the frequent occurrence of albumen in small amounts and the presence of hyaline and granular casts. Abdominal pain was the most prominent clinical symptom, occurring in fifteen of the twenty-one cases. The liver was frequently enlarged, whereas the spleen was only found to be increased in size in one instance. Other symptoms were found less often. Skin manifestations occurred in eleven cases; arthritis in six; peripheral neuritis in five. sore throat in four; and asthma in three.

DISCUSSION

With the accumulation of these case reports there have grown up certain ideas regarding periarteritis nodosa which it may be well to discuss.

Age.—The disease may occur at any age, in

TABLE III.

Author	Year	Age	Sex	Duration	Pulse	Temperature	Blood Pressure	Red Blood Cells in Millions	Hemoglobin %	Blood Count					Urine	Abdominal Pain	Liver	Spleen	Peripheral Neuritis	Skin Manifestations	Asthma	Sore Throat	Arthritis
										White Blood Cells	Polymorphonuclears	Lymphocytes	Monocytes	Eosinophiles									
1 Dickson	1908	14½	M	10W	85 98	96° 101°		Anemia +		Normal					alb. tr.	+	0	0					
2 Longcope	1908	35	M	8W	56	96° 101°			58	13,200 30,000					alb. tr. hy. gr. casts		+	0					+
3 Cooke	1911	10	M	11W		98° 102°				16,800 17,700	80				alb. tr. hy. gr. casts				+				
4 Lewis	1911	33	M	10W		101°			50	17,600				22 30				+					
5 Beattie and Douglas	1912	19	M	8W	82 118	100°										+			+				
6 Lamb (1)	1914	26	M	11W	85 130	98.6° 101.8°	145 105	3.5	42 75	20,900	32 58	11 17	0 5	51 23	alb. ÷ hy. gr. w.b.&c.r.	+	0	÷	+	+			+
7 Lamb (2)	1914	10	F	9W	74 120	99° 103.2°	104 60			33,100 39,800 40,400	93 90 73	9 27	1		alb. tr. hy. gr. casts	+	0	0	+	+		+	+
8 Klots (1)	1917	33	F	4W		100° 103°				12,000	76				alb. ÷ granc. c. w. b. c.	+	0	0		0	+	+	
9 Klots (2)	1917	53	M	18M		100° 103°		2.9 2.5		7,400 13,600 21,000					alb. ÷ casts	+	0	0	+	+		+	
10 Cameron and Laiglaw	1918	27	M	5M		100°									alb. tr.	+	+		+	+			
11 Manges and Baehr	1921	39	M	6M		102° 103°	160 90			36,000 54,000 20,000	75 90				normal	+	+	0	+	+		+	
12 Harris and Friedrichs	1922	32	M	5½W	80 130	97° 103°	140 80			10,000 16,600	71 80	25 15	3 4	1	Alb. 0	+	+	0					
13 Carling and Hicks	1923	30	M	9M		99° 101°				18,000 30,000 14,000	71 86 67	24 6 21	4 8 9	1 0 3	normal				+	+			+
14 Ophuls	1923	38	M	8M	70 110	to 103°	100 80	4.0	70	6,300 11,500	nor mal			0	alb. ÷ hy. gr. casts	+	+	?	+	+		+	
15 Wordley	1923	13	M	2M	100	100° 101°	106			16,000	82	14	2	2	alb. ÷ hy. gr. casts blood cells	+	0	0					
16 Cleland	1923	18	M	9W	90 140	97° 102°				17,700 13,600 20,000	90				alb. ÷ hy. gr. casts	+		0	+	+		?	?
17 Keegan	1925	24	F	3M	120	103°	125 90	4.2 3.5	60 60	20,000 40,000 29,600	90 82 84				alb. tr. casts ÷ white blood cells	+	+	0					
18 Gray	1926	12	M	9W	136	102°																	
19 Singer (1)	1927	29	M	5M	80 90	N. 99.6	200 140	2.26 1.2 1.8		11,000				4	alb. ÷	+	+						
20 Singer (2)	1927	57	M	6M	100	97°	245 130			11,400 21,350 44,000	83 93			2	alb. ÷ hy. gr. casts	+	+		+				
21 Strong	1928	46	F	11M	90 120	97° 100.8	160 100	5.0 4.5	90	32,000 16,000	17 71	7 19	3	76 7	alb. tr. hy. gr. casts	++	+	0	+	+	+	0	0

fact Gruber² records instances of periarteritis nodosa in a baby two and a half months old and in a man seventy-eight years old. Most cases occur, however, in the third and fourth decades, at the time of life when infections and infectious processes are most common.

Sex.—The disease is more common in man. Gruber² states the sex in a series of one hundred and thirteen cases, eighty-seven of which were men and twenty-six women; and in this present tabulation of twenty-one cases, seventeen are men and four women. Periarteritis nodosa is therefore three to four times as common in men as in women.

ETIOLOGY

The cause of periarteritis nodosa is as yet unknown. Since the disease was first recognized various theories have been advanced, some of which deserve mention only to be excluded.

Syphilis.—At one time syphilis was thought to be the cause of periarteritis nodosa as it has frequently been blamed for many another obscure disorder. The fact that there is a true syphilitic arteritis confused the issue for some time. However, in periarteritis nodosa the Wassermann reaction has usually been negative and histological examination of the arterial lesions stained by the Levaditi method has repeatedly failed to show any spirochaetes. It seems definitely established that syphilis plays no part in the production of the lesions of periarteritis nodosa. The fact that the disease has been found in animals, *i.e.*, the deer, calf, pig and dog² further excludes the possibility of syphilis as the cause.

Mechanical causes.—The rather bizarre idea was at one time advanced that the multiple aneurysms found in cases of periarteritis nodosa were due to a rupture of the elastic membranes caused by increased intravascular pressure. Needless to say, careful study of the pathogenesis of the lesions of periarteritis nodosa readily disproved this idea.

Parasites.—The theory that periarteritis nodosa might be due to parasitic disease gains strength from certain observations quoted by Cameron and Laidlaw.²² There is a disease of horses characterized by multiple aneurysms along the mesenteric vessels which is known to be due to the parasite *Strongylus armatus* and certain aneurysms in dogs are caused by a

nematode worm *Spirocerca sanguinolenta*. In the latter the mode of attack of the vessel, the resulting degeneration of the media, and the formation of aneurysms, is most suggestive. The presence of an eosinophilia favours parasitic disease. This blood finding, however, is not universal and it hardly seems possible that the causative parasite could have been overlooked in all the cases studied.

Streptococcic Septicæmia.—A streptococcic septicæmia was at one time thought to be the cause. Numerous cultural studies that have been made, however, both on the blood and other body fluids before death, and on the blood and various tissues after death, refute the possibility of an acute streptococcic infection as the cause of periarteritis nodosa.

There remain three possibilities to be discussed in connection with the present view as to the etiology. These are (1) the filterable virus; (2) rheumatic infection; and (3) the idea that periarteritis nodosa is not due to any specific cause but is rather a reaction on the part of the vascular tissues to certain "toxic" or "infectious" factors.

Filterable Virus.—Harris and Friedrichs²³ were able to produce in a rabbit typical changes of periarteritis nodosa from intravenous injection of a filtrate prepared from the organs of another rabbit that was killed two and a half months after inoculation with a suspension made from the nodules of a human case. In their opinion periarteritis nodosa is due to a specific causal agent, a filter passer. These results have not yet received verification from other studies. In fact, Otani³⁰ has challenged them, and Franz⁶ failed to reproduce the disease in guinea pigs. Even so, a filterable virus must still be considered as one of the possible causes.

Rheumatic Infection.—While an acute streptococcic infection is not a likely cause of periarteritis nodosa, the less virulent type of streptococcus associated with rheumatic fever may be the offending organism.^{21, 26} The not unusual association with sore throat, the arthritis and muscle pains, some of the cutaneous manifestations, and the leucocyte count, all suggest an infection, and an infection of the rheumatic type. The pathogenesis of the lesions in periarteritis nodosa also is extremely suggestive of an infectious origin. The early cases show acute inflammatory changes, which later,

if time permits, develop a sclerosis as an attempt to heal the injury wrought by the acute manifestations. This process is well illustrated by the case of Manges and Baehr,²⁸ in which a periarteritic node removed at operation showed definite acute and subacute reactions, while the study of the autopsy material, obtained three and a half months later, showed none of these acute changes.

The third remaining view as to the etiology of periarteritis nodosa is that it is not a disease *sui generis*, but rather a reaction on the part of the organism to some unknown factor, the reaction being located in certain areas of the arterial system. This theory, while not at all new, is strengthened considerably by the fact that it has received the support of Gruber who has given the subject considerable attention. The changes in the arteries may be a non-specific response to a number of different agents, toxic or infectious as the case may be, or these reactions may be evidences of a hyperergy to some bacterial organism. The latter possibility is of interest in connection with the relation to rheumatic infection. As already pointed out there are certain points of resemblance between periarteritis nodosa and rheumatic fever, and further consideration should be given this possible relationship. A recent suggestion, by Swift and his co-workers,³¹ regarding the possibility that rheumatic fever itself is a hyperergy to a non-haemolytic streptococcus is of considerable interest. The present stage of our knowledge of periarteritis nodosa does not permit of conclusive views as to either the cause of the disease or the pathogenesis of the lesions. The possibility that periarteritis nodosa also may be a hyperergy is worth considerable thought. This hyperergy may be to a filterable virus or to a non-haemolytic streptococcus, or to any other as yet unknown organism.

PATHOLOGY

The pathology of periarteritis nodosa is not entirely established, for while it has received much more consideration than the clinical condition, there are still divergent views as to the pathogenesis of the described lesions. No attempt can be made in this paper to enter into any discussion of the pathology of periarteritis nodosa and the following views are in the nature

of a summary of what appear to be the most logical of the recent opinions.

Periarteritis nodosa presents an involvement of arteries of the size of the coronary and main branches of the renal artery; the larger vessels, the aorta and its main branches, usually escape and these smaller vessels bear the brunt of the attack. The most frequent location is in the principal divisions of the renal arteries.² The next most frequently involved are the coronary vessels, then in order the mesenteric vessels, the branches of the hepatic artery and cystic arteries, the arteries to the other viscera, the cranial arteries, and the peripheral arteries. The predominant involvement is, therefore, in the medium-sized arteries. Extension is seen into the branches of these arteries and may even extend to arteries of very small calibre. Venous involvement has been described^{2, 26} but is not usual.

The pathological changes may be divided into (1) the changes found in the vessels themselves, and (2) the changes occurring in the organs and tissues as a result of the disturbed circulation.

GROSS CHANGES

The involved arteries may show small aneurysms or nodular formation, or may only reveal a diffuse thickening without any nodular appearance. Nodosities, when they occur, may be very profuse, even to the extent of producing a resemblance to a string of beads. These nodules may, on the other hand, be widely scattered and only discovered after careful search. The cases of periarteritis nodosa in which no nodule formation can be seen and in which involvement is entirely diffuse are those in which a diagnosis can only be made after careful examination of the microscopic sections. Lamb²⁰ mentions this occurrence in five cases and points out that this fact may lead to the disease being overlooked both clinically and pathologically. That such is not often the case, however, is shown by the further fact mentioned by Lamb that in a review of all cases of nephritis occurring at the Presbyterian Hospital during a period of six years no case of periarteritis nodosa was found, although a careful search for the disease was made. The arterial involvement may be localized to any one organ, or any one part of the body, or it may be diffuse. Extravasation of blood from rupture of one of these small aneurysms or diseased vessels

may occur producing, for example, hæmorrhage into the peritoneal cavity, gall bladder, perirenal spaces, cranial cavity, and so forth.

The gross appearance of the heart is often strikingly characteristic. On opening the pericardium the coronary vessels stand out as thickened nodular cords. The kidney may present gross evidences of the disease, showing miliary nodules scattered throughout the substance, particularly visible on longitudinal section. Involvement of the intestinal tract may occur as a result of thrombosis of the mesenteric vessels, infarction or ulceration, particularly in the ileum. The liver in most cases is enlarged and on section presents fibrosis or passive congestion.

MICROSCOPICAL CHANGES

The microscopical appearance of an affected vessel depends upon the stage of the disease. Early there is an acute perivascular infiltration extending into the adventitia. This cellular infiltration is usually polymorphonuclear, though it may be round-celled or occasionally may consist of eosinophiles.^{21, 26} The congestion resulting from this infiltration leads to an occlusion of the vasa vasorum, with a resulting necrosis of the media and a weakening of the elastic laminæ. Necrosis in the media is followed by a hyaline connective-tissue replacement, which also occurs in the adventitia. The weakening of the elastic laminæ results in rupture which frequently leads to the aneurysm formation so typical of the disease. At times the involvement of the vessel is focal, so that nodular formation may occur as a result of the increased thickening of the layers of the arterial wall but without true aneurysm formation. The intima is not usually involved though even this coat may not escape. Thrombosis is a frequent result, especially when aneurysm formation occurs, and may go on to complete occlusion of the vessel, producing an infarct, or at times evidence of recanalization can be found. The late stages of periarteritis nodosa present a striking fibrous tissue thickening of the arterial wall, particularly the media and adventitia, this fibrous tissue occurring in an irregular arrangement that produces a diffuse or nodular involvement of the artery. In these late stages the cellular infiltration has usually disappeared. The

spread of this inflammatory process is by way of the perivascular lymphatics.²¹

The microscopical changes produced in the viscera are those depending upon interference with the blood supply and are cloudy swelling, fatty degeneration, cortical necrosis, or other evidences of cellular destruction. This results in the nephritis, myocardial degeneration, ulcerative enteritis, cerebral involvement, and so forth, that may develop in these cases and which may so dominate the picture, both clinically and pathologically, as to obscure the true diagnosis. The kidneys show the most marked changes, early involvement causing tubular degeneration often to the extent of fibrous tissue replacement. This process may go on without involvement of the glomeruli, though at times there is an extension of the inflammatory process into the kidney substance with widespread destruction of renal tissue. Involvement of the arteries of the heart leads to the usual picture of cardiac muscle degeneration. The liver is frequently the site of an extreme grade of passive congestion which may present the appearance of cyanotic atrophy. The reason for this congestion is not entirely clear, since it is out of proportion to other evidences of myocardial weakness. At times there is a considerable fibrosis present in the liver substance. Infarcts may occur in any of these organs or in other involved areas.

Periarteritis nodosa is a vascular disease and it is only the arterial lesions that are typical. A fatal outcome in periarteritis nodosa may occur as a result of injury to the vessel itself, as rupture or thrombosis, or as a result of degeneration of an organ as a consequence of this arterial disease.

SYMPTOMS AND PHYSICAL SIGNS

As might be expected from the complex character of the pathological findings, the symptoms of periarteritis nodosa are many and varied. The onset of the disease may be acute or insidious, the acute onset being associated with the more fulminant type of case, whereas the insidious onset usually occurs in the chronic case. Abdominal pain is a very frequent symptom. The origin of this pain is not entirely clear, most writers being satisfied with the explanation that it is due to involvement of the mesenteric vessels. Weakness is another symptom prominent out of all proportion to

the severity of the physical signs of the disease. This weakness is such an outstanding feature that chlorotic marasmus is frequently mentioned, particularly in the earlier descriptions of periarteritis nodosa. Loss of weight is usually a noticeable feature, in the more acute forms of the disease this weight loss being the rapid emaciation of an acute illness, while in the chronic forms there is usually considerable gradual loss of weight accompanying the loss of strength. Most of the cases of periarteritis nodosa exhibit a temperature at some time in their course, though fever is not a constant symptom. In some instances the febrile course is distinctly septic, while in others the temperature is subfebrile.

The pulse is rapid, usually out of proportion to the degree of temperature, and this tachycardia has received much comment. The frequency of involvement of the coronary vessels would naturally lead one to anticipate a certain amount of myocardial insufficiency, which would account for this increased pulse rate. Dyspnoea also may be noted, although it is by no means the pronounced distress which characterizes a failing myocardium. Other evidences of decompensation, as oedema and cyanosis, are not common, though oedema may occur as a result of renal insufficiency.

Blood pressure in those cases in which it is recorded is frequently elevated. The urine usually shows a small amount of albumen, and very frequently hyaline and granular casts. These evidences of renal involvement are not surprising in view of the frequency with which the disease attacks the renal arteries.

In a number of cases sore throat has been noted at the onset of the disease. Pains in the muscles are a common feature. These pains may be so severe as at times to suggest an actual invasion of the muscle tissue, so that polymyositis is a common finding in the clinical picture. Arthritis has also been noted. In fact the occurrence of these three symptoms has given additional weight to the theory that periarteritis nodosa may be a manifestation of a rheumatic type of infection. The patients in some of the reported cases have suffered from asthma and the possibility of periarteritic involvement of the bronchial vessels makes this symptom a likely one in any case.

Peripheral neuritis occurs fairly frequently.

Whether this neuritis is a result of decreased blood supply to the peripheral nerves because of periarteritic involvement of their nutrient vessels, or whether the neuritis is a toxic result of the disease itself is not entirely clear.

Various skin manifestations have been reported in this disease. In addition to the subcutaneous nodules which occur as a result of the involvement of the arteries in this area, other skin lesions may present themselves. Urticaria and pruritus are commonly noted. Purpura occurs at times during the course of the disease; at other times it is a terminal feature.

The liver is usually enlarged, though the reason for this is not altogether clear. The moderate evidence of myocardial insufficiency would account for a certain degree of passive congestion which is frequently found in the liver, but would not explain the extreme degree of congestion which is out of all proportion to the other evidences of congestive heart failure. The spleen is seldom enlarged.

Leucocytosis is invariably present. This leucocytosis varies from 10,000 to 30,000 per c.mm., or in some few cases even to 40,000 or higher. The differential count usually shows a preponderance of polymorphonuclears with, in some few cases, increased eosinophile counts. There is usually, though not invariably, an accompanying secondary anemia.

When the cerebral arteries are involved symptoms due to the involvement of the central nervous system are prominent. Cranial nerve lesions may occur, and delirium, convulsions and varying degrees of coma may be noted.

Death may occur suddenly from rupture of an aneurysm producing a fatal hæmorrhage, or may be due to secondary degeneration of certain organs as a result of the arterial disease producing, for example, uræmia or myocardial failure.

DIAGNOSIS

The disease is a sub-acute, febrile, wasting illness, characterized particularly by abdominal pain, unusual leucocytosis, peripheral neuritis and myositis and evidence of nephritis. When subcutaneous periarteritic nodules occur (in 20 per cent of cases) the possibility of making a diagnosis is increased. The course of the disease is characterized by irregular exacerbations and remissions. The varied nature of the symptom

complex has naturally led to an extremely wide range of ante-mortem diagnoses, those most commonly noted are sepsis, typhoid fever "acute abdomen", trichinosis, nephritis, peripheral neuritis, myositis, miliary tuberculosis, dysentery, purpura, meningitis, encephalitis, or any one of a wide variety of other conditions. The cardinal symptoms of periarteritis nodosa are gastrointestinal manifestations, chlorotic marasmus, peripheral neuritis and nephritis.

DURATION

The duration of periarteritis nodosa shows considerable variation from case to case, although the duration period reported must be accepted with reservations because of the frequent insidious onset and also because of the fact that clinical observation in these cases has often been most fragmentary, the diagnosis only being made after death. The duration reported varies from six days to two years. The average duration in fifty-eight of the cases reported by Gruber,² in which sufficient information is given to be accurate regarding this point, was 4.7 months.

PROGNOSIS

The prognosis in a disease almost always diagnosed after autopsy is apt to be very bad. Gruber in fifty-four cases, reviewed in his 1926 article, mentions four cures, two of which he queries, while in my twenty-one collected cases there was only one cure. It is generally believed that some mild cases may go on to recovery. The pathological evidence seems to show that there is a definite effort at repair and it is possible that the mortality in this condition may not be so high as the above mentioned figures would indicate. The fact that the changes of periarteritis nodosa are very rarely found at post-mortem examination, even where large numbers of autopsies are done, would indicate that it is a rare disease with a high mortality.

TREATMENT

Since the cause of the condition is unknown the treatment is entirely symptomatic. It is of interest to note that in the case reported by Carling and Hicks,²⁵ recovery occurred after the administration of an anti-syphilitic arsenical given intravenously. The exhibition of such a drug would seem to be indicated in cases where the diagnosis is established at a time when treatment might be of some value.

DISCUSSION OF SPECIAL FEATURES IN THIS CASE

The case here reported presents certain features which merit further consideration.

Absence of Anæmia.—The absence of anæmia in this case was one of the factors which prevented a proper diagnosis being made before death. A cursory review of available text-book descriptions of the disease, at the time the subcutaneous nodule was excised, stressed secondary anæmia as a most prominent feature of the condition. In this case the red blood count was five millions at first and even shortly before death had only fallen to four million five hundred thousand. In spite of this high red count the patient presented a marked pallor, which point, with her weakness, might easily have been interpreted as the chlorotic marasmus of the earlier descriptions.

Unusual Eosinophilia.—The unusual differential count presented in this case a very striking feature. The eosinophiles at one time reached 79 per cent of 31,000 white blood cells. It was the presence of this eosinophilia which at first made us consider a diagnosis of parasitic disease. The combination of the eosinophilia and subcutaneous nodules, with pain in the muscles, led us to a tentative diagnosis of trichinosis. In this connection it is of some interest to note that Kussmaul and Maier in their original report thought at first they were dealing with an unusual case of trichinosis because of the subcutaneous nodules and muscle pains, and only after autopsy did they discover the unusual character of the arterial lesions. Eosinophilia has been reported in a few cases,^{18, 20} although in none has it been so high as 79 per cent. This case did not show the presence of eosinophiles in the cellular infiltration in the periarteritic lesions. This is of interest in connection with the case reported by Ophüls,²⁶ in which eosinophiles were present in the cellular exudate but were not increased in the circulating blood.

Asthmatic Attacks.—The asthmatic attacks occurred early in the disease, and even after disappearing recurred again shortly before death. The microscopic sections of the lungs in this case did not show evidence of periarteritic disease. It is possible that more careful examination including the branches of the pulmonary artery and the bronchial vessels might have revealed such evidence. The fact that a diagnosis

of periarteritis nodosa was not made at the time of autopsy prevented us from collecting as complete a series of tissue sections as otherwise might have been done.

Peripheral Neuritis.—Peripheral neuritis was noted in this patient on my first examination. At that time there was a slight but definite atrophy of the smaller muscles of the hand and complaint of persisting neuritic pain in the forearm and hand. This neuritis progressed in the course of the illness until shortly before death it was a much pronounced feature.

Abdominal Pain.—The abdominal symptoms shown were striking, the patient having recurring paroxysms of abdominal pain associated with nausea and vomiting. The pain was umbilical or epigastric in location and came on in attacks which persisted for varying periods. The pain was not accompanied by any evidence of peritoneal irritation, and there was no rigidity of the abdominal wall. The pain was not associated with the taking of food and was definitely remittent and during these remissions the patient was free from gastro-intestinal disturbances.

Skin Manifestations.—Pruritus was an early feature which was largely disregarded because of the neurotic nature of the patient. This itching was at times accompanied by an urticarial eruption. At other times the pruritus was severe without any visible evidence of skin lesion. Purpuric spots were not frequent, the one purpuric area that was found was a large patch on the left leg which was undoubtedly factitious in origin.

Renal Insufficiency.—The clinical evidences of renal insufficiency were slight as compared with the pathological evidence of kidney involvement. This is in part undoubtedly due to the fact that the kidney lesion was a tubular one resulting from the arterial disease. It is possible that had the patient escaped her terminal infection further evidence of nephritis would have appeared. Death was due in this case to an intercurrent infection, a terminal pneumonia with an acute pleurisy. It is interesting to note that the white blood cells which had been persistently high fell after the onset of the pneumonia. With this fall in the white blood cells there was an increase in the polymorphonuclears.

Duration.—In this patient the symptoms of her last illness could be definitely traced back eleven months before her death. This is longer

than the average duration (4.7 months). The pathological changes observed in the vessels in this case would suggest a long course, the acute cellular reaction having subsided and hyaline-tissue replacement being well advanced.

Pathology.—Except for the subcutaneous nodules, one of which was removed before death, and the character of which we failed to appreciate, there was no other gross evidence of nodosities of the arterial walls. This is not entirely unusual. Lamb has noted the fact that in five cases no gross evidence of the disease was apparent and the only evidence was microscopic.²⁰ There was an unusual degree of passive congestion of the liver in this case. This passive congestion was out of all proportion to the other signs of heart failure and was apparently a result of a disturbed circulation to that organ. The kidneys presented a most unusual appearance; grossly they showed areas of pallor, alternating with areas of congestion. There were, in addition, a few small cortical abscesses, possibly infected infarcts. Microscopically, the lesion was a degeneration of the tubules with very marked periarteritic involvement of the renal arteries. Involvement of the veins, reported in a few cases,^{2, 26} was not noted. The finding of several ulcerated areas in the ileum, which could be accounted for at the time of autopsy, is readily understood by the periarteritic involvement of the arteries in the intestinal wall shown in the sections. The ulcers were obviously early and could have produced no serious clinical effects.

SUMMARY AND GENERAL CONCLUSIONS

1. A case of periarteritis nodosa in a woman of middle age. The disease was of long duration, subfebrile, and characterized by intermittent abdominal pain, progressive weakness, and peripheral neuritis of the upper extremities. Subcutaneous periarteritic nodules occurred, one of which was excised. The diagnosis was not made at that time, but was only established after study of the microscopic sections taken at autopsy. There were no other gross evidences of nodular arterial disease.

2. The eosinophilia, up to 79 per cent, is unusual.

3. This case throws no definite light on the etiology of periarteritis nodosa. The most likely possibility seems to be a rheumatic in-

fection, with the changes either the result of the invasion of the causative organism (streptococcus ?) or the result of a hyperergy to such an organism, in this disease this hyperergy being manifest in certain areas of the arterial system.

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THE DIAGNOSIS AND TREATMENT OF PERNICIOUS ANÆMIA*

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THE existence of a formative and healing power inherent in the organism, by which it preserves itself and combats morbid causes and their effects, is one of the great discoveries of Hippocrates. Even in the present era of medicine we are but beginning to understand the nature and location of some of these forces; to recognize their deficiency, and to devise methods of substitution when they are inadequate. Kendall made possible scientific thyroxin therapy; Banting followed with insulin for diabetes mel-

litus; and Minot and Cohen have just shown that pernicious anæmia may be controlled by the oral administration of an aqueous extract of liver.

Someone has aptly remarked that the first step in treatment is diagnosis, that the second is diagnosis, and that the third is diagnosis. This aphorism seems to be particularly applicable to pernicious anæmia. In its diagnosis due consideration must be given to every fact which can be elicited as a result of both clinical and laboratory study. There is no single characteristic of the disease which may not be present in other entirely independent pathological states. Par-

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æsthesia, asthenia, and progressive pallor with good nutrition, a lemon tint of the skin, atrophy of the tongue, and achlorhydria occurring in a middle aged person are at once suggestive of the disease but are not diagnostic. It is not many months ago since a case, in our experience, presented the above signs and symptoms, and these were considered sufficiently complete to disregard a blood report entirely unfavourable to the diagnosis of pernicious anæmia. Some months later the man reported with an inoperable carcinoma of the stomach. In another instance, to the chagrin of the hæmatologist, a case presenting typical blood features proved later to be a slowly progressing aleukemic lymphosis. It is only by the careful weighing of all available evidence that such mistakes can be avoided.

The time of onset of pernicious anæmia is commonly from the fifth to the seventh decades. The youngest case admitted to the Montreal General Hospital in five years was 31, and the oldest 72. The tint of the skin is often striking, varying from a pale waxy sub-icteroid tint to a definite ochre colour, or actual bronzing if the patient has had prolonged arsenic therapy. The nutrition is said to be maintained, but in our experience it is not uncommon to find a considerable loss of weight. Seventy-five per cent of our cases weighed 125 lbs. or less on admission. The atrophy of the tongue begins at the tip and edges and may involve the entire dorsum. Small ulcers are not infrequent. Achlorhydria is universally considered as a *sine qua non*. The blood pressure is seldom if ever elevated. It is usually below the expectancy for the age; the highest systolic pressure recorded in our series was 150 mm. Hg.

Degenerative changes in the central nervous system, as a rule involving the posterior and lateral columns of the spinal cord, are invariably found if they are looked for. During the years 1925, 1926 and 1927, out of 56 recorded cases, 48 showed undoubted evidence of this degenerative process. Prior to this time the incidence was found to be much lower, because it was not often recorded. The most common symptom to which this form of sclerosis gives rise is paræsthesia in the extremities, with numbness, tingling, or a sensation of "pins and needles." On examination, it is rare to find any alteration in tactile, painful, or thermal sensation, but the vibratory sense and two-point discrimination are almost constantly affected. Paresis of the legs is not uncommonly present, but it rarely proceeds to definite paralysis. The myotatic reflexes are

frequently absent, but they may be exaggerated and associated with marked ataxia and clonus. The involvement of the motor tracts is indicated by the Babinski phenomenon. The innervation of the bladder is rarely attacked—only twice in the series. An acute psychosis occurred five times. The following statement shows the frequency of the various signs referable to lesions in the nervous system.

Number of Cases (1925, 1926, 1927), 56; paræsthesia, 48; vibratory sense or two-point discrimination, 31; atonia, with diminished or absent reflexes, 9; ataxia, with exaggerated reflexes, 5; Babinski phenomenon, 8; acute psychosis, 5. Occasionally cases of pernicious anæmia make their appearance with signs and symptoms directly referable to the central nervous system. The main complaint is difficulty in walking, weakness in the legs, or paræsthesia. Clinically, there is little or no evidence of anæmia. On examination of the blood, however, the characteristic picture is present, though the actual reduction in the cytological elements may not be great. These cases are often most discouraging from a therapeutic standpoint, for, though the blood may improve, the cord changes are often progressive, eventually involving the brain itself, with a fatal outcome. In two of three such cases in our series treatment failed to influence the progress of the process, while in the third it was apparently successful.

The blood picture has long been considered to indicate a hyperactive process of destruction and regeneration. The anæmia, with excess of bilirubin seems to point to rapid hæmolysis. The abundance of immature cells, notably reticulocytes, macrocytes and megalocytes, indicates hurried formation. On the other hand, the late Professor Peabody's investigation rather suggests that this blood picture may be due to a functionally inefficient marrow with lack of utilization of blood pigment. Be this as it may, a high colour index, bilirubinæmia, macrocytosis, increase in reticulocytes, leucopenia with relative lymphocytosis, are features of the disease. In this connection it may be stated, that a smear of blood showing a predominance of large highly coloured erythrocytes is much more characteristic of pernicious anæmia than is a smear showing a number of small and deformed cells of various sizes and shapes, whether these be nucleated or not. (see Fig. I).

Each case of possible pernicious anæmia should, therefore, be investigated and judged on the basis

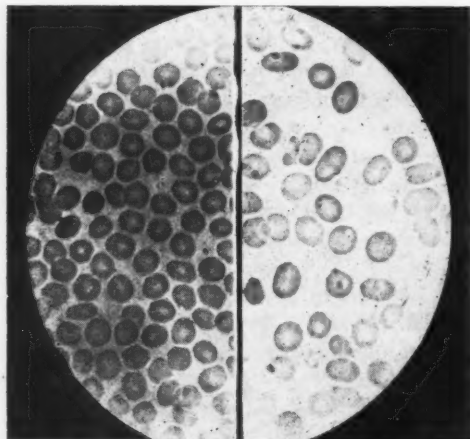


FIG. 1.—Microphotograph of a smear of blood obtained from the case represented in Chart III. For comparison with it, is a smear of normal blood photographed at the same time using the same magnification. The pathological cells (on the right) are larger, more deeply coloured, and more variable in size.

of the following: (1) Atrophy of the tongue and achlorhydria; (2) Pallor of the icteroid type; (3) Signs of subacute sclerosis of the nervous system; (4) Reduction in the number, but increase in the size of the erythrocytes, high colour index, leucopenia with relative lymphocytosis, and increase in the plasma bilirubin; (5) Excess of urobilinogen in the urine. The absence of one or more of these features is insufficient to exclude the disease.

For the present effective treatment of pernicious anaemia let us pay ungrudging tribute to the fundamental observations of George Whipple, of Rochester. To him and to his co-workers should go the credit for the experimental demonstration that liver occupies the supreme position as a regenerator of blood. The successful clinical application of his experimental results, as applied to pernicious anaemia, was first demonstrated by Campbell P. Howard, now of McGill. The more recent and more detailed studies of George Minot and the Boston group of investigators have placed the liver treatment of this disease upon a sound practical basis, and have convinced practically the entire medical world of its clinical value, in an incredibly short period of time. From England, from Australia, and from the Continent, corroboration is forthcoming. Finally Cohen, in conjunction with Minot, was able to recover from liver an aqueous extract many times more potent than the original substance in the treatment of pernicious anaemia. The nature of this effective liver fraction and its

mode of action are both uncertain at the present time. In the process of its separation from liver, proteins and iron are removed by fractional alcoholic precipitation. The final water-soluble moiety contains the active principle. Speculation is rife as to its nature. It is claimed to be a vitamin, but the word "vitamin" is being used too loosely nowadays to convey any accurate meaning. It is known that the fraction contains a substance or substances in the polypeptid or amino-acid groups, for it gives the biuret reaction. All else is theory.

Little more is known of its mode of action. From Peabody's recent investigation of the bone marrow before and during liver treatment, it would seem that the active fraction enables the erythroblastic process to proceed to maturity. After liver therapy, though the marrow may have a less active appearance, functionally it is much more efficient; it can produce more red cells per unit of time. Whether this is accomplished by the neutralization of the effect of some unknown bacterium, or by the addition of a hormone deficient in the disease, or by some other means, is a problem yet to be solved.

The question of whether liver is effective in anaemias other than the Addisonian type is so frequently asked that a brief digression here may be pardoned. We have tried liver therapy in a considerable number of cases of the secondary type of anaemia, in which the etiology was obscure, with excellent results. One should recall that the entire experimental investigation which proved its worth was carried out on dogs with a secondary form of anaemia. The explanation would seem to be that whole liver supplies an abundance of iron in a readily assimilable form.

So much for the scientific side of liver therapy. We now turn to the more practical question of how to obtain results with it. The patient should be put to bed, as rest is an important factor, especially if the anaemia is severe. The diet should be well balanced, relatively low in fat, and should include raw or cooked liver in amounts from 200 to 500 grams a day. It is usually advisable to give dilute HCl with the meals. When the blood values have been restored to normal, which usually requires from six to eight weeks, its continued use is still a necessity. The daily amount may be reduced, and in certain cases three liver days a week seem to be adequate. The necessary amount in each individual case must, of course, be gauged by the results. A monthly check of the blood will tell whether

sufficient is being taken. What is adequate in one case may be inadequate in another.

The liver may be prepared to suit the palate of the patient. It may be ground up in soup, served as a cocktail, made into sandwiches, or even added to chocolate ice cream. It should not be boiled, however, as the potent portion is soluble in water.

Where the anæmia is grave and attended by nausea, vomiting, and intolerance to food, liver extract is indicated. We have tried the effect of four different samples, manufactured by three different pharmaceutical houses. The method of assay which was adopted was as follows. The patient was put to bed, and placed on an ordinary hospital diet, plus the extract to be tried in daily amounts equivalent to 400 to 500 grams of liver. The reticulocytes were counted daily. If at the end of a ten-day period there was no appreciable rise in the percentage of these young cells in the circulating blood, the sample was discarded as non-potent. An instance of the failure of one sample, and the prompt response to a second, is shown in Chart IV. Both the Lilly Fraction and the Connaught Laboratories Extract were found to be of satisfactory potency.

The effect of liver and liver-fraction therapy on the cord changes is less striking than on the blood. In most cases, probably the great majority, the progress is apparently arrested, provided the blood is maintained at a normal level. Occasionally, marked improvement occurs, especially in the tabetic type which seems to respond better than do the spastic cases. One of our cases, who took only sufficient liver to maintain the blood at the three million level, showed, after a time, progressive cord lesions of the spastic type. When he was given liver fraction the blood showed a rapid rise to the normal figure. With the aid of physical therapy the clonus and Babinski sign disappeared, and he is slowly regaining his normal gait. In a few cases, and this is specially true of those in which cord signs and symptoms predominate from the onset, little or no beneficial effect other than on the blood is noted, and the case progresses to a fatal termination though the blood count may improve considerably. Fortunately, this latter type is rare; there were only two in this series. Taking the disease as a whole, it is evident that early diagnosis and prompt adequate treatment are essential if permanent cord damage is to be prevented.

In the accompanying tables the effect of liver

and of liver fraction therapy are graphically represented. It will be noted that the first sign

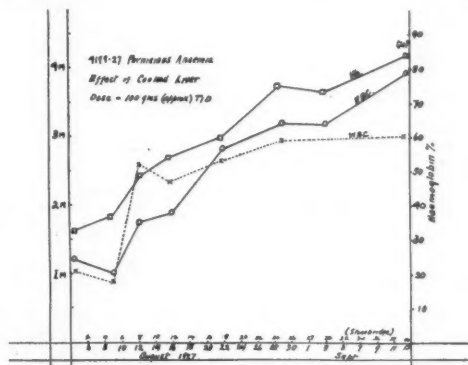


CHART I.—This shows the effect of whole liver (300 gm. per day) on the hæmoglobin, the red cells, and the leucocytes in a case of pernicious anæmia. The time period was 40 days, the same as in Charts II, III, and IV.

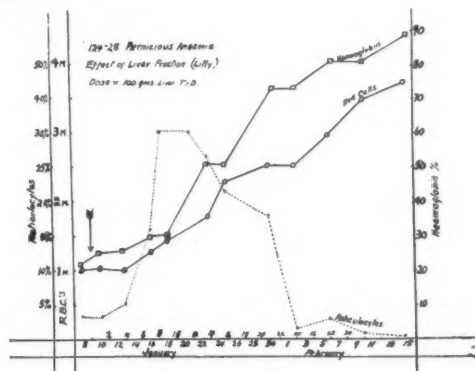


CHART II.—This shows the effect of liver fraction (Lilly) (equivalent of 300 gm. of liver daily) on the hæmoglobin, the red cells, and the reticulocytes, in another case. The arrow indicates the point at which treatment was begun. It is to be noted that the reticulocyte level rises before improvement is noted in the red cell count.

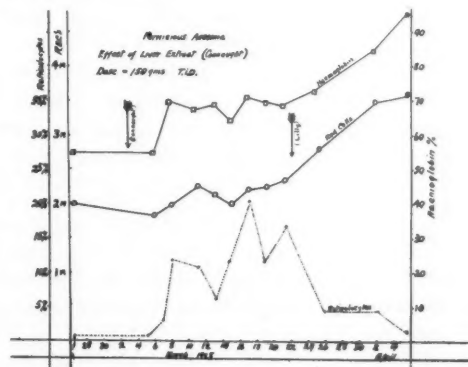


CHART III.—This shows the response of another case to a different type of extract. (Connaught Lab. extract, equivalent of 450 gm. of liver daily).

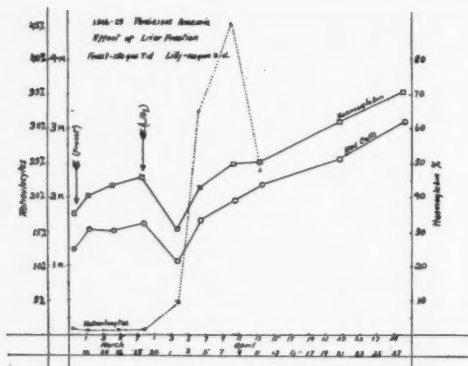


CHART IV.—This shows the failure of a non-potent extract of liver, and the prompt response to another type, used on the same case. The arrows indicate the points at which each was begun.

of improvement in the blood picture is a rise in the reticulated red cells, indicating an improvement in the numerical output of cells from the bone marrow. This is noted for several days prior to a demonstrable rise in the actual number of red cells per unit volume of blood. During this time there is a considerable improvement in the patient's subjective symptoms. The tinnitus, or pounding in the head, disappears, the lethargy is replaced by alertness, and the anorexia by a desire for food. In a few days the rise in the blood count is noted. It progresses at an almost surprising rate until the three million level is reached, after which the rise is much more gradual. Perhaps the most interesting case, from a therapeutic standpoint, which has come under our observation, is one which has been watched continuously since 1919. (See Chart V.). During 1920 and 1921 the effect of transfusions was observed. In 1921 splenectomy was performed. In 1924-1925 transfusion was combined with iron and arsenic therapy. Finally 300 grams of liver daily was substituted. The improvement was rapid and so far permanent.

Varicose Veins.—H. O. McPheeters and Carl O. Rice, Minneapolis, believe that the treatment of varicose veins by the injection method should not be attempted by those who are not aware of the complications, as an unduly zealous individual may bring into disrepute through errors in technique a very satisfactory mode of treatment. The mortality rate following the injection treatment of varicose veins is much less than with the operative treatment. There is not, as yet, one solution alone which can be considered entirely adequate for very purpose. Each solution has quite definite indications. The injection treatment of varicose veins has passed the experimental stage and has been proved to

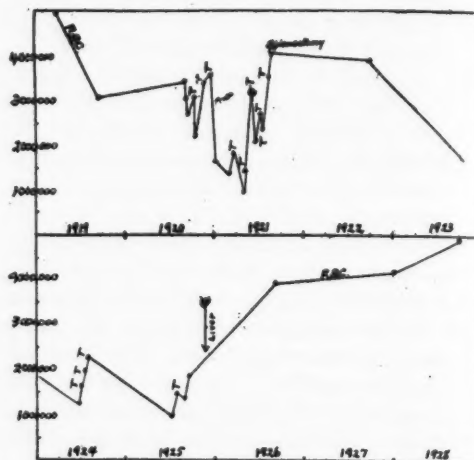


CHART V.—This shows the red cell count of a case 1919-1928. T. represents transfusion. Until liver therapy was begun, transfusion was supplemented by iron and arsenic therapy. The arrow shows where the patient began to take liver.

It is, perhaps, too soon to voice an opinion as to the permanency of the remission produced by liver fraction. Out of 25 cases who took the diet or extract, under constant supervision, 22 are now well after periods varying from one to three years. Two cases died as a result of progressive cord changes. One case refused to take adequate amounts of liver, and now shows rapidly advancing cord lesions though the blood picture has improved somewhat. Be this as it may, for the patient with pernicious anaemia a new era has begun.

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be a very rational form of treatment which should be accepted as supplanting other well recognized methods of therapy.—*J. Am. M. Ass.*, 1928.

The inventor of soda water was the Rev. Joseph Priestley, who was a renowned chemist and especially known as the discoverer of oxygen. Being persecuted in England for his political views, he sought refuge in Pennsylvania, where his experiments aroused the interest of Dr. Philip Syng Physick, of Philadelphia. The latter induced a local druggist to prepare carbonated water for his patients, adding fruit juice as a flavouring. Thus, in 1807, the soda water business came into being.

THE POST-OPERATIVE ACCIDENT*

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I HAVE so often referred to post-operative dangers and accidents in my efforts at clinical teaching, that it seems natural enough I should endeavour to work off a few thoughts on the subject on this occasion.

CASE 1

Mrs. F. was fat and healthy, weighed 200 pounds, was forty years of age, and had a large umbilical omental hernia. She agreed to an operation which was performed in the usual manner. An attempt was made, after separating adhesions, to repack the herniated omentum into the peritoneal cavity. Failure; then removal of a piece of omentum and closure of the sac, with the peritoneum tending to stretch and tear under the strain. The sac is closed, but the pressure underneath is still pushing up into the open space, and you look uneasily at the anaesthetist who with a strange, unexplainable irony is letting the patient come out. One cough and you will be gathering up the fragments. It is an exciting moment. But finally the incision is closed, and one has made the best job in the circumstances. Catgut No. 2, silkworm gut deep sutures, then a dressing strapped on with adhesive strips an inch wide, and a many tailed abdominal binder pinned on to help keep the dressings in place. The patient returned to the ward.

On the 7th day the deep sutures were removed; the wound was reported as healing well. On the 9th day patient took a coughing fit and something gave way. Being in the hospital at the time, I was hurriedly called. A number of intestinal loops were sticking between the tails of the abdominal bandage (now little more than strings gathered up in the middle of the abdomen). The incision was opened up. The omentum was bulging into the wound; some recently formed adhesions were now doing their full duty in preventing complete evulsion. This is the picture as one recalls the case. It is typical enough of that type where rupture of a post-operative wound occurs from greatly increased intra-abdominal pressure.

CASE 2

Sister M. was of the delicate type. Thin, pale, relaxed, anæmic, always tired, sleeping indifferently, nibbling at her food; while she kept about her work faithfully, she showed no energy, and was the very antithesis of bodily vigor. She had always been more or less so, but a bleeding fibroid had lately added a secondary anemia to her physical imperfections.

With rest and careful nursing she was made an operative risk, and a sub-total hysterectomy was performed, from which she made a good recovery. Twelve days later, and two days following the removal of the sutures, in what seemed healing by first intention, she had a coughing fit, and the incision opened from end to end. When I got to her she was partly disemboweled. The many-tailed binder was as usual gathered up in the middle of the abdomen like so many strings, and of no

protective value whatever. The nurse had covered the extruded intestines with sterile towels awaiting my arrival, so that things were not quite so bad as they could have been.

CASE 3

A man aged 72 years was operated on for acute appendicitis. The appendix had not ruptured, and there was nothing of note in the whole surgical entity, unless it were the marked senile sclerosis of his vessels. He became distended on the second day and was given a large soap suds enema with turpentine, without results. The distension was increased on the third day, without pain and vomiting, but with considerable distress. Those responsible for the conduct of his case decided that the bowels must be moved, and proceeded heroically to the task. One large enema after another was given, of soap-suds, turpentine, oxgall, magnesium sulphate, ammonia and molasses, with negative results, the patient's discomfort increasing proportionately to this therapeutic activity. On the fourth day severe abdominal pain and vomiting supervened, and all the signs of general peritonitis. *In extremis* the incision was opened for the purpose of stitching a tube in a loop of distended bowel, when it was found that the peritoneal cavity was half full of the enemata mixtures. The appendix stump was wide open, and the copious colonic floods had broken through into the peritoneal cavity as through a hole in the bottom of a rubber bag. Did the nurse not report siphoning back after each enema? She did; but good intentions and arithmetic are not always found combined. We are dealing with facts. Their exceptional character may hold some comfort; their reality remains undisturbed.

DISCUSSION

Cases 1 and 2 furnish the principal text for this paper. Case 3 must come in a class by itself, and I realize what a small part of the post-operative danger zone I shall cover in this effort.

The elements entering into the rupture of a post-operative abdominal wound are: (1) increased intra-abdominal pressure; (2) feeble healing power of tissue; (3) suppuration; (4) defects in the mechanics of the incision and the wound closing, including defective catgut, etc.

Numbers one and two are illustrated in my first two cases, and they must bear the blame for the great bulk of this class of accident. Suppuration is often enough the cause of a weakened scar and consequent hernia; not often, of spontaneous rupture of wound and evulsion of viscera. The inflammatory process tacks the omentum and bowel down at the peritoneal margin of the wound, and, by thus plugging the opening, prevents a more serious disaster; not

* Read at the annual meeting of the Canadian Medical Association, Charlottetown, June 20, 1928.

the only time adhesions exercise a beneficent rôle.

At staff meetings and clinical gatherings in general, when a case of wound rupture is reported, I invariably find that all discussion and speculation are directed to the fourth cause, and particularly to the question of defective catgut. Assuming that the wound is closed in the manner followed by 95 per cent of operators, I think this agent is the least of all the causes entering into the genesis of post-operative rupture. Catgut which stands the actual strain of holding together the layers, when stitching is completed, is quite likely to continue to do as much as we have right to expect of any suture in the circumstances. The deep intra-fascial silk worm gut strands are a great support, but they, too, have their limitations. There is no suture 100 per cent safe in such cases as the first. Two real factors are at work; (1) enormously increased intra-abdominal pressure; and (2) parietal tissue permeated with fat, which makes it brittle and easily torn. For this reason catgut is probably as safe as linen or silk, if not indeed safer, inasmuch as it is not so likely to cut through on account of its softer and stretching qualities. Split-muscle incisions and other anatomical side-stepping with the rectus and its sheath make for parietal security, but, for the average operator, have only a limited application.

The second case illustrates a type of post-operative rupture in which increased intra-abdominal pressure is not the main cause. There is no great pull on the suture line, and the skin and deep sutures are removed after what seems to be primary union. It is a feeble kind of repair, however, and is liable to let go. A sudden push on the abdominal wall from a sneeze or cough may be enough to open the whole wound. Distended intestines or anything which temporarily increases the intra-abdominal pressure may do the same. Scar tissue in such a patient matures more slowly, and calls for more careful support.

TREATMENT

By all the dicta of surgical common sense the treatment is prophylactic. Gathering up intestinal loops from among the bed-clothes is a bad business, particularly when you know it need not have happened. It is a real disaster, and unless skilled help is at hand, the patient and

all concerned are badly out of luck. The whole matter resolves itself into proper support of the abdominal parietes until the new scar may be depended upon to do its work.

Prof. Babkin, of Dalhousie University, has performed a number of experiments for me, in order to demonstrate some of the factors entering into what we have been calling intra-abdominal pressure. For the practical clinician perhaps the best concept of the whole mechanism is obtained by regarding the abdomen as a cylinder and the intra-abdominal pressure hydrostatic and distributed equally. Visualizing your lines of force with the patient in the recumbent position, the arrow points of the wound radiate from the centre in all directions, the sum total of the forces tending to stretch and rupture the abdominal cylinder. The lower end of the cylinder is closed and strongly reinforced with bone, fascia and muscle. Behind, the spine and the powerful contiguous muscles and ligaments present a practically unyielding structure along this section of the tube. The diaphragm and the belly wall are the yielding parts, and must furnish accommodation for any unusual push from within. The latter bears the real brunt; for the diaphragm, by its respiratory motion, acts something like a piston, modifying the pressure with each movement.

A newly closed abdominal wound is, therefore, among other things, a problem in physics. The forces drawing it apart are not concentrated on the edges of the incision, but extend all around the surface of the cylinder. The indication, then, is support all round, so that there is no unprotected spot in the whole abdominal wall. The best way seems to imitate nature's plan and supply an additional paries in the form of a heavy abdominal binder. It should be pinned on tightly and held below by wide strips of adhesive plaster extending over the outer surface of the thighs, and above by adhesive plaster extending along the sternum. An essential thing is that the binder have a grip on the thorax and on the pelvis. The mechanics of the binder is thus borrowed from the anatomical arrangement of the abdominal muscles and fascia, and in this way alone is it a real support. Without such attachments it will roll up from below, and down from above, by the patient's movements, and you will find, as I have so often observed, that the binder is little more than a few strings, if

it be the many-tailed type, or a very ineffective, puckered up band, in the middle of the abdomen. Prof. Babkin by artificially increasing intra-abdominal pressure in a number of cats showed experimentally the efficiency of this type of abdominal support.

It has been objected that a binder tightly attached to the lower thorax embarrasses respiration, and adds to the post-operative distress of the patient. With careful adjustment this need not be, and the splinting of the whole abdominal musculature lends a degree of comfort, such as obtains in a wounded limb after it is dressed and immobilized. Every houseman I have had become a convert to this kind of post-operative bandaging, not only on account of its primary object in preventing rupture of the incision, but also on account of the patient's feeling of well-being as compared to his unbandaged neighbours in the ward. It is hardly necessary to say that the bandage is applied on the operating table and the post-operative nurse knows her duty appertaining in the ward.

Case 3 is quoted here to remind us that the human colon, wonderful piece of sewerage as it is, has nevertheless limits of endurance which may not be ignored. Have you ever on the operating table examined a colon in the condition usually described as post-operative ileus? What is it like? The bowel wall is so thin that you can hardly with the finest needle put a stitch in without perforating it. It resembles nothing better than a blown-up rubber toy

balloon which is on the verge of rupturing. It has no tone; it is a passive non-contractile tube that for the time has lost its power of responding to stimuli. Surely the indication here is rest and not more exquisite forms of colonic torture. Heroic efforts to move the bowels in such a case is flying in the face of physiological law, and clinical experience points a warning finger to just such a case as that quoted.

If there is no response to a moderate sized enema it should be siphoned back, the patient given $\frac{1}{4}$ gr. morphine, and allowed to sleep. Often one finds that the bowels move after a few hours of rest without further enemata. There seems to have been too much emphasis on the paralyzing effects of morphine on the bowel. The precious rest it induces in such a case restores the whole physiological stance and knits up the unravelled threads of nerve exhaustion, so that the bowel comes back from a negative to a positive poise.

In conclusion. What are now pointed out are among the self-evident things, the trifles in connection with an abdominal operation. One's observation is that it is the obvious, often, which is overlooked; and when one recalls even the exceptional instance where an excellent piece of surgical effort was wrecked on account of neglect of these trifles, he begins to wonder whether Michael Angelo's words might not be applied to our art as well: "Trifles make perfection and perfection is no trifle."

THE COMPLEMENT FIXATION TEST, A MEANS OF FINDING CARRIERS OF DISEASE

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DURING the early spring of 1928 a mild epidemic of scarlet fever was reported in the Montreal Unit of the Shriners' Hospitals.

The first case followed a burn. The possibility of scarlet fever following this burn was known—indeed, so well known that the physician who rendered first aid to the patient employed anti-streptococcal serum as prophylactic treatment, although the patient had not been in contact

with anyone suffering from scarlet fever. The second, third and fourth cases were definitely due to contact. The later cases were not due to contact but were considered to be due to the presence of an unknown and unidentified carrier. How could this carrier be found? Apparently science had shown no way.

It was known that scarlet fever was caused by, or at least is coincident with, an infection

by one of the strains of streptococcus. The doctrine of transmutation is accepted by many bacteriologists. An infection by streptococci may be shown in a variety of forms; at one time as one condition, at another time by another condition.

About this time a young adult, who had no connection or contact with the Shriners' Hospital, contracted scarlet fever. How and where was not known. The patient was sent to the Alexandra Hospital, an institution devoted to the treatment of contagious diseases. In approximately one week after the diagnosis of scarlet fever was made in this patient, the mother became infected with erysipelas. Within two weeks after the mother's infection, the first patient's brother became infected with what two prominent physicians called malignant tonsillitis. These physicians would have preferred to have called this scarlet fever, as they knew of the sister suffering from this condition, but they felt their patient's condition did not conform to type. Within three weeks after the diagnosis had been made a fourth case of definite and typical scarlet fever appeared in the same family.

The epidemic of scarlet fever in the Shriners' Hospital was militating against the usefulness of that institution. The extraordinary history of the four patients mentioned above was an incentive to thought. Scarlet fever is due to a streptococcus or, at least, is coincident with a streptococcal infection. Streptococci might show their presence in various ways, in some cases causing different conditions. Yet streptococci are wholly or coincidentally the cause of scarlet fever, and without streptococci there can be no scarlet fever. Streptococci must be present as a precursor to scarlet fever. If the complement fixation test is of any value, surely this was a

time in which it should be found of service. For this reason, Dr. F. Green, the Serologist of the Shriners' Hospital was instructed to take the complement fixation test in the four persons who had been in closest contact with the several patients who had contracted scarlet fever during the epidemic in that hospital. He reported that three of these patients were negative to the complement fixation test. The fourth was positive to polyvalent streptococcus (three plus) and also to scarlatinal streptococcus. After the elimination of this person the epidemic was at an end. This bore out and seemed to confirm the hypothesis, but one swallow does not make a summer. For this reason it was decided that a systematic investigation should be made of the complement fixation test in scarlet fever. Dr. Lawrence J. Rhea, Pathologist of the Montreal General Hospital, and Dr. H. B. Cushing, Chief Physician of the Alexandra Hospital, were asked to aid in assuring that such might be carried out. Through the interest of these two it was made possible for Dr. Green to make the complement fixation test in about forty cases of scarlet fever which were being treated in the Alexandra Hospital during the summer of 1928.

Dr. Green has handed his report to the Chief Surgeon of the Shriners' Hospital. It was published in the last number of the *Canadian Medical Association Journal*. While this most interesting publication does not prove the contention that carriers of scarlet fever can be found by the use of the complement fixation test, a promising piece of work has been initiated, and it is hoped that it will lead to further investigation and further knowledge of scarlet fever, and the value of the complement fixation test as a means of finding carriers of disease.

Dextrose-Insulin Treatment of Shock.—Dextrose-insulin treatment of shock is discussed by Preston A. Wade, New York. He says the use of dextrose intravenously with insulin subcutaneously in the treatment of shock gives results which, in this series, seem more satisfactory than those obtained in cases treated by saline or dextrose solution alone. Cases of traumatic shock treated early respond most readily to this treatment. Cases of post-operative shock treated in this manner show marked improvement. The optimal dosage is 1,000 c.c. of 5 or 10 per cent dextrose with 1 unit of insulin to 3 Gm. of dextrose. Beneficial results are usually ap-

parent after 800 c.c. of fluid has been injected. Cases of shock in which the blood pressure is decreasing toward the "critical level" (80 to 90) should be treated immediately before the rapid fall which usually follows, with symptoms of severe shock.—*J. Am. M. Ass.*, June 9, 1928.

In 1927 only four cases of small-pox occurred in Germany. These had all been introduced from foreign countries. In the same year no fewer than 14,800 cases were notified in England and Wales.—*Brit. M. J.*, 1928, ii, 552.

NEPHROSIS IN CHILDREN*†

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II. LABORATORY FINDINGS.

NEPHROSIS is one of those diseases in which the aid of the laboratory is not infrequently sought in order to establish a definite diagnosis. This is more particularly true in the chronic cases which often present a clinical picture identical with that seen in other types of kidney disease. Distinctive deviations from the normal are found in nephrosis, not only in the blood, urine and tissue fluids, but in the altered metabolism of the whole organism.

The most striking change in the urine of these patients is the large amount of albumen it contains. It literally 'boils solid.' Estimations of its protein content show that it constantly contains anywhere from one to thirty grams per litre. This excessive loss of protein may continue many months, or even years, without much variation in its severity. Closer study shows that this protein contains a larger proportion of globulin than is usually seen in cases of proteinuria. This relative increase in globulin has been shown by Kollert and Starlinger¹ to depend on the increased globulin fraction of the blood serum. None of the excessive protein excreted can be accounted for by hæmaturia, as the finding of the latter absolutely precludes the diagnosis of uncomplicated nephrosis.

The amount of urine voided during the early acute stages or in an exacerbation is usually small. It becomes excessive during the period in which œdema is being excreted. During quiescent periods or after recovery the daily excretion is normal. Nocturia rarely occurs except during diuresis. Wide variations in the specific gravity of the twenty-four hour specimen are seen, but in most cases it is between 1012 and 1015.

Microscopically the urine contains many casts, numerous white blood cells, and an occasional red blood cell. The casts are at first chiefly granular, both fine and coarse, and are very

numerous. Later, they become fewer in number and hyaline ones are more common. The number and nature of the casts in nephrosis is interesting in view of Christian's² contention that all casts are composed of material from the tubular epithelium, the granular ones being young and the hyaline old. Less easily demonstrable, but by many regarded as pathognomonic, are the doubly refractile bodies found in the urine in these cases. Such bodies are seen in other types of renal disease in which extensive tubular involvement is present as well as in nephrosis.

The urine calcium in two cases of nephrosis has been studied by Scriver³ who reports its concentration to be very low. As pointed out in a previous paper⁴ low urinary calcium is found in all forms of kidney disease and is not distinctive of any one type. Retention of both sodium and chlorine occurs⁵ in the hydropic stage of this disease as in other types of nephritis, but shows no peculiarity which would differentiate it from any other type.

The appearance of the blood is suggestive very soon after its withdrawal. The corpuscles separate more rapidly than normal and leave a serum varying from slightly turbid to distinctly milky in appearance. Fibrin clots form quickly, probably because of the great increase in the fibrin content of the serum which Kollert⁶ has shown to be present in these cases.

The results we have obtained in the study of the blood in some of our cases of nephrosis are given in Table I. The percentage of corpuscles present in the blood is usually less than fifty, often as low as twenty to thirty. The cell-volume tends to become lower as the disease becomes chronic and during periods of dropsy. The depression is not always directly proportional to the degree of œdema present.

The low protein content of the serum is constantly present. Epstein^{7,8} some years ago pointed this out and further demonstrated the alteration in the albumen-globulin ratio due to the relative increase of the latter. The combination of low cell-volume, low hæmoglobin and low protein would suggest blood dilution as the common cause of all three. Lindner, Lundsgaard and

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† Part I, Nature, Etiology and Pathology, *Canad. M. Ass. J.*, 1928, xix, 46.

TABLE I.
BLOOD FINDINGS IN NEPHROSIS

Case	Protein Per Cent	Corpuscles Per Cent	Turbidity of Serum	NFN	Creatinine	Urea	Fat	Cholesterol	Na.	K.	Ca.	Mg.	Total Base	Phosphates	Chlorides	Sugar Per Cent	Edema	Notes
B. R.	4.10	30	+++	65	1.9	—	1938	209	—	—	—	—	142.0	4.8	420	—	+++	Terminal
A. K. 1	3.50	46	+	29	1.5	—	513.8	348	—	—	—	—	—	4.6	390	—	+++	Acute
A. K. 2	4.40	30	Sl.	—	—	—	—	—	—	—	—	—	—	4.6	520	—	0	Acute
A. K. 3	7.20	45	0	—	—	—	—	—	—	—	—	—	—	5.4	375	—	0	Acute
E. L. 1	5.97	40	+	—	—	—	—	454	—	—	—	—	—	—	—	.063	+++	Chronic
E. L. 2	6.34	36	+	25	1.5	—	454	358	—	—	—	—	—	—	565	—	0	Chronic
R. B.	5.03	33	+	25	1.3	—	—	830	—	—	—	—	—	5.2	230	.060	+++	Subacute
E. R.	—	—	0	40	3.0	28	990	258	—	—	—	—	—	—	550	.089	+	Acute
P. C.	—	—	—	30.2	1.1	22	620	198	—	—	—	—	—	—	560	.090	+	Acute
N. M.	—	—	—	18.4	1.6	13.4	800	198	—	—	—	—	—	—	600	.108	+++	Chronic
E. R.	8.06	31	+	45	1.5	—	467	170	—	—	—	—	—	5.2	510	—	0	Chronic
R. C.	—	—	—	23.1	1.2	15	600	140	—	—	—	—	—	—	600	.108	+	Chronic
R. D.	6.05	29	++	28	1.5	—	—	155	—	—	—	—	—	5.6	565	.083	+++	Chronic
E. D. 1	6.03	50	++	35	+6	20.3	—	—	351	21.5	3.6	1.5	162.3	3.8	700	.078	+++	Chronic
E. D. 2	5.00	41	++	40	—	25.1	—	290	399	21.0	4.6	1.8	158.3	3.6	710	.084	Sl.	Chronic
E. D. 3	—	—	—	28.5	9.2	—	—	—	—	—	—	—	—	—	—	.310	Sl.	Terminal
E. C.	—	50	0	—	—	—	—	—	360	19.8	8.5	1.79	167.1	3.8	610	—	+	Acute
D. H.	—	50	0	—	—	—	—	—	356	20.5	10.0	1.70	165.6	5.0	650	—	++	Acute
A. J.	6.00	50	0	30	—	—	—	—	330	19.6	9.3	1.90	151.8	5.5	580	—	+++	Acute
A. C.	7.20	26	+	30	5.0	—	—	—	—	—	—	—	150.0	9.0	500	—	+++	Terminal
C. B.	6.10	41	Sl.	35	1.5	—	—	—	—	—	—	—	—	—	—	—	+	Acute
L. L.	—	—	—	26.4	1.2	21	—	—	—	—	—	—	—	—	—	.065	++	Chronic
L. G.	—	—	—	38.5	1.0	—	—	—	—	—	—	—	—	—	520	.072	++	Chronic
H. D.	4.84	37.5	+	40	1.5	—	—	—	—	—	—	—	—	—	—	—	+++	Chronic
D. L.	—	—	—	30	1.2	23.1	—	—	—	—	—	—	—	—	—	.100	++	Acute
B. S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+++	Terminal

Unless otherwise indicated, figures represent milligrams per 100 c.c. of blood, except in the case of total base which is given in terms of c.c. of N.I.

Van Slyke⁹ have shown however, by estimating protein per body weight, that such is not the case but that actual depletion of serum protein is present. Brown and Rowntree¹⁰ further demonstrated in the three cases they studied that the blood volume was normal. No close relationship is demonstrable between the degree of edema present and the blood protein but the tendency is toward an increased blood protein after diuresis. Possibly the altered ratio between the albumen and globulin is more closely associated with the degree of edema present, as Lindner *et al.* have shown that this ratio falls when edema is present in nephrosis.

Lipæmia of some degree is a sufficiently constant finding to justify the name lipæmic nephritis, frequently given the disease. It is not the only lipæmic nephritis however. Hyperlipoidæmia was present in only one of our cases, a terminal one of syphilitic origin. The cholesterol shows a relatively greater increase than the total fat. We agree with Harrison¹¹ however

that little help in differentiating between nephrosis and other types of nephritis with tubular involvement is given by the determination of cholesterol. The degree of turbidity of the sera in these cases appears a better indication of its fat content than it does in cases of diabetes. Below are the maximum, minimum and average figures we obtained in the study of the blood fat and cholesterol in these cases. The determinations were made by Bloor's method.

	Blood fat	Blood cholesterol
Maximum	1938	830
Minimum	434	140
Average	797	298

There is usually no evidence of retention of nitrogen and products in nephrosis; indeed the absence of such is usually regarded as necessary in making the diagnosis. Exceptions to this rule do however occur as a terminal event in otherwise typical cases which have run a chronic course. In such cases creatinin is most markedly increased. Nitrogen retention probably occurs

in cases which have been typical nephroses but have developed a chronic interstitial nephritis secondary to their nephrosis.

The blood sugar is usually normal or low. Hyperglycæmia was present in one of our cases and has been reported in another by de Toni¹².

The plasma chlorides tend to vary with the degree and the stage of œdema present. Generally speaking, during the acute or hydræmic stages of the disease hypochloræmia is found. As the disease becomes chronic or recovery ensues they reach a normal or high level but are quickly lowered if for any reason œdema develops again. The plasma sodium is normal. Phosphates are normal unless acidosis is present. Magnesium is constantly at a low normal level and potassium at the upper limit of normality. The variation in the total base-content of the blood is not striking but it is usually about the lowest limit of normal, or actually decreased.

Clausen¹³ and Clark¹⁴ have demonstrated a marked lowering of the surface-tension of the plasma in nephrosis. Some reduction is present in cardiac œdema but is not nearly so marked.

Clausen finds this surface-tension reducing substance in the urine as well as the blood.

Characteristic changes are also found in the fluid which accumulates so rapidly and persistently in the thorax and abdomen. The turbidity of this fluid is so great as to suggest pyogenic infection. Cultures however are sterile and the sediment consists of broken down endothelial cells and amorphous material. The turbidity is due to the increased fat content. The specific gravity, salt and protein content of these fluids, is low.

The results obtained when the renal functional tests were done on thirteen of our cases are given in Table II. The most constantly present and valuable diagnostic aid is the normal blood pressure. Increased systolic blood pressure excludes nephrosis as the cause of the symptoms present, except in those rather rare cases in which the disease has a sudden stormy onset with cerebral œdema. The rise in such cases may be great but is necessarily of short duration. Persistent elevation of blood pressure never occurs in nephrosis.

TABLE II
FUNCTIONAL TESTS IN NEPHROSIS

Case	Blood Pressure	Phenol-sulpho-nephthalein*	Concentration†	Water‡	Added Salt	Remarks
L. L.	105-75	12.75	1011-25 N.1011	1007-30%	—	Chronic case
R. D.	102-72	—	—	—	Poor	Acute cerebral œdema present
"	98-64	—	1014-20 N.0	—	Poor	Acute case subsiding
J. B.	100-80	42.	1020-25 N.0	1004-100%	Fair	Acute
N. M.	102-70	19.4	1030-32 N.0	1002-37%	Poor	Chronic
A. K.	98-60	—	1014-16-	1002	—	Acute
E. D.	100-75	—	1008-14 N. 1014	—	Poor	Chronic
"	85-47	37	1011-21 N.1021	1004-44%	—	"
H. D.	100-75	20	1006-18 N-	1002-100%	—	Chronic
P. C.	—	38	1025-30 N. 1030	1008-25.9%	Good	Acute
L. G.	100-80	—	1013-19 N.1018	1005-52%	—	Acute subsiding
E. R.	98-70	38	1012-20 N. 1012	1000-52%	Poor	Chronic
C. C.	—	51	1018-26 N-	1005-34%	—	Acute
E. R.	105-84	(1) 20.3 (2) 62.5	1020 N. 1020	1005-30%	—	Acute
R. C.	102-70	(1) 22.5 (2) 58.3	1013-37 N.1030	1004-81%	Fair Good	Acute

*Phenolsulphophthalein is the percentage of the drug injected excreted in 2 hours. †Under concentration test the variation in specific gravity and its height in the night urine are given. ‡Under water test the lowest specific gravity obtained and the percentage of the intake excreted in the first 4 hours are given.

The phthalein test appears to be an unfair test of renal function in this disease and is therefore of little value. The response to the injection is almost invariably poor and we feel that extrarenal factors, such as oedema and altered capillary permeability, prevent its quick absorption and that its slow excretion is therefore no indication of impairment of renal function.

The concentration test, simply done by determining the specific gravity of two hour urine specimens, while the patient is on a dry diet, offers the most valuable aid of any of the tests in making a prognosis. Functional deficiency in this case is usually most noticeable in the failure of the patient to concentrate his night urine as well as usual. Persistently low specific gravity of the night urine and decrease in its daily variations warrant a prognosis of chronicity, whatever the clinical condition of the patient suggests.

Water tests usually demonstrate some delay in the ability of the kidney to excrete water and a less marked depression of its function of diluting. They are of little value in making a prognosis as complete recovery is quite possible in spite of poor response to the test.

The excretion of added sodium chloride is always poor, and the test should not be done in these cases as it not infrequently initiates a relapse.

As pointed out in a previous paper, the laboratory furnishes some evidence of the systemic nature of the disease as demonstrated by the reduction of the basal metabolic rate. This depression of basal metabolism has been noted by a number of observers and is of too great magnitude to be accounted for by the oedema present. It is a constant finding in those cases of nephrosis studied by this means.

Case of Hæmaturia from Shoe Dye Poisoning.—O. J. Schmitt cites the case of a boy, aged 17, of athletic stature, who wore freshly dyed shoes for seven hours, when cyanosis and headache made their appearance. When seen, three hours after onset of the symptoms, his face and finger nails were deeply cyanosed and he complained of severe frontal headache. The rate and character of the pulse, respirations and temperature were normal. He was advised to bathe the feet repeatedly in water; to take a sponge bath and a purgative; to drink large quantities of water; to put an ice cap on the head, and to rest near an open window. The cyanosis and headache had entirely disappeared by the next morning, but the patient was advised to remain

SUMMARY

1. The characteristic changes in the urine in nephrosis are; the large amount and the unusual nature of the protein it contains, the absence of gross hæmaturia, the presence of large numbers of casts and frequently white blood cells and of a doubly refractile body.

2. The distinctive findings in the blood are; its low protein content, altered albumen-globulin ratio, lowered surface tension, more or less lipæmia especially cholesterolemia, and the practical absence of any evidence of nitrogen retention.

3. Serous effusions present suggestive evidence of the presence of the disease by their turbidity, low protein and salt content, and increased fat.

4. The blood pressure in uncomplicated cases is always normal or low.

5. The basal metabolism is depressed.

6. The concentration test is the only one of the functional tests that gives any reliable aid in making a prognosis.

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quiet. The urine the following day was a clear, dark amber, acid in reaction, and with a specific gravity of 1.025. Two days later the patient complained of dysuria and bloody urine. The blood pressure was 124 systolic and 80 diastolic; the red cell count, 4,120,000; leukocytes, 11,850, and hæmoglobin, 75 per cent (Tallqvist). Alkaline drinks, together with a bland diet and rest in bed, were ordered, and in the following two days the pain gradually disappeared, the urine resumed its normal clear amber colour, and at the end of five days no red blood cells could be found microscopically. The analysis of the dye as reported by the chemist showed aniline as the source of poisoning.—*J. Am. M. Ass.*, 1928, xci, 726.

THE CALCIUM AND PHOSPHORUS CONCENTRATION IN THE INTESTINAL CONTENTS OF RATS IN RELATION TO RICKETS*

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IN the present paper are reported the results of an investigation of the concentration of calcium and phosphorus in different sections of the intestinal tract of rats fed on McCollum's rachitogenic diet 3143¹ and of a group of rats on a normal diet. The hydrogen-ion concentration of the different sections was also determined. The rats were divided into two groups, one kept inside in the dark and allowed to develop rickets, and the other exposed to the rays of the fall and winter sun, which produced a slight but definite antirachitic effect.

Each week a number of rats, twenty-five to twenty-seven days old, were placed on the rachitogenic diet, and a group of them exposed to the sun's rays each day for two hours. After four weeks the rats were killed under ether anaesthesia and immediately thereafter dissected and the intestinal contents removed by gentle pressure. The intestine was divided for this purpose into five portions: A, the upper half of the small intestine; B, the lower half; C, the caecum; and D and E the upper and lower halves respectively of the remaining large intestine. If during anaesthesia faeces were dejected these were collected and formed a sixth portion, designated F.

A composite sample was made of the contents of each of the six sections of the intestines of all the rats in a single cage. After withdrawal of a small sample for estimation of hydrogen-ion concentration each total emulsion was dried to constant weight on a steam-bath and the dried material was used for calcium and phosphorus determinations. On five occasions the hydrogen-ion concentration estimations were made on the material from each rat separately. This was done in order to learn what was the range of variation for the rats in the same cage. For the most part there was no marked variation, but occasionally one rat in a cage would show en-

tirely different pH values from all the others in the same cage.

Hydrogen-ion concentration was estimated by the Levy, Rowntree and Marriott colorimetric method, as applied to faeces by Tisdall and Brown².

For the calcium and phosphorus determinations Tisdall's micro-methods for use with blood serum^{3 4} were modified for application to dried material. For estimating total phosphorus the dried substance was ashed with a mixture of sulphuric and nitric acids in a large Pyrex test tube with the careful employment of heat from a micro-burner. The solution was made to volume, an aliquot part almost neutralized with concentrated ammonia water, and the original method for serum followed.

The procedure for estimating calcium and inorganically bound phosphorus is as follows: Place the weighed samples in 15 c.c. graduated centrifuge tubes and add to each about 5 c.c. of a six per cent solution of trichloroacetic acid. Mix thoroughly and extract by tapping the tubes at intervals for about fifteen minutes. Centrifuge and pour off the extract into small volumetric flasks (20 to 25 c.c.). Repeat the process with the residues. Only two extractions are necessary to remove completely the soluble calcium and phosphorus. Make the extracts to volume, and determine calcium and phosphorus in aliquot parts.

A characteristic condition of the intestines and their contents in the three groups of rats was observed during the dissections. There was little apparent difference among them in respect to the contents of the small intestine. In all, the upper part was filled mainly with mucus and the lower with mucus intermingled with small quantities of faecal matter. The contents of the large intestine showed distinct differences in the three groups. In the rats on normal diet the caecum was always large and filled with faecal material of a soft and homogeneous consistency, while in the rats on the rachitogenic diet the caecum was

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small and the contents scanty. The contents below the caecum were in separate small masses in all the rats, but there was a marked difference in the consistency of these masses in the three groups of rats. In the rachitic rats the contents were rather hard; in those on the rachitogenic diet exposed to sunshine they were soft, sometimes almost watery; while in the normal rat they were firm but distinctly softer than in the rachitic rats. In both groups of rats on the rachitogenic diet there was more or less distension with gas in the neighbourhood of the caecum. In these groups also the intestinal walls were thin and fragile, in contrast with the substantial condition of the walls in the rats on normal diet.

In the tables the calcium and phosphorus values are expressed as grams per gram of total solids. In the consideration of these values it must be kept in mind that they represent the concentration of calcium and phosphorus, not the actual amounts present. Under the conditions of the experiment it was not possible to establish any relationship between amount of intake and amount of intestinal contents. Accordingly a strictly quantitative collection of the material was not attempted.

Table I. includes for each of the two groups of rats on the rachitogenic diet and for a third group on a normal diet hydrogen-ion concentration,

TABLE I.

TOTAL CALCIUM AND PHOSPHORUS IN INTESTINES OF RATS AND pH; GRAMS PER GRAM OF TOTAL SOLIDS.

Region	Calcium		Phosphorus		pH	
	No. Rats	Calcium	No. Rats	Phosphorus	No. Rats	pH
Rats on normal diet.						
A	18	.0052	17	.0145	21	6.3
B	18	.0131	21	.0133	21	6.4
C	21	.0358	21	.0222	21	6.4
D	12	.0311	16	.0186	21	6.8
E	20	.0330	16	.0200	21	7.1
F	20	.0318	12	.0186	21	7.2
Rats on rachitogenic diet. Inside.						
A	21	.0060	22	.0141	26	6.7
B	21	.0133	22	.0123	26	6.9
C	26	.0425	20	.0141	26	7.2
D	16	.0375	10	.0134	26	7.2
E	19	.0432	10	.0126	26	7.3
F	15	.0443	10	.0126	17	7.0
Rats on rachitogenic diet. Exposed to sunshine.						
A	13	.0053	25	.0148	25	6.7
B	20	.0170	21	.0117	25	6.6
C	25	.0300	25	.0136	25	6.6
D	16	.0372	8	.0102	25	6.7
E	16	.0372	8	.0102	25	6.6
F	8	.0560	8	.0120	21	6.9

total calcium, and total phosphorus for the six sections separately.

The total calcium and total phosphorus values for the rats on a rachitogenic diet show no essential differences between the rats kept inside and those exposed to the sun, with the one exception of the calcium content of the caecum which was markedly higher in the rats kept inside. This striking difference will be discussed in connection with Table III.

The differences for both calcium and phosphorus between the rats on the normal and those on the rachitogenic diet are presumably largely due to the differences in the calcium and phosphorus intake as shown in Table II.

TABLE II.

CALCIUM AND PHOSPHORUS CONTENT OF NORMAL AND OF RACHITIC DIET; GRAMS PER GRAM OF TOTAL SOLIDS

	Calcium	Total Phosphorus	Inorganic Phosphorus	Organic Phosphorus
Normal diet . . .	.0083	.0060	.0023	.0037
Rachitogenic diet	.0107	.0033	trace	.0033

The hydrogen-ion concentration shows significant differences in the three groups. The normal rats have an acid reaction in the beginning of the small intestine and the reaction becomes more alkaline throughout the tract. The rats on the rachitogenic diet, whether exposed to the sun or not, have a more alkaline reaction at the beginning of the small intestine than the normal rats. With those kept inside the reaction begins at once to increase in alkalinity. On the other hand in the rats exposed to sunshine the contents remain at practically the same reaction throughout the course of the intestines. These findings are in general agreement with those reported by Tisdall and Price⁵, which were obtained from rats exposed to sunshine during the summer months.

In Table III. the phosphorus values are expressed as inorganically and organically bound phosphorus. This table also shows the amounts of Ca and inorganic P in combination as tricalcium phosphate and the excess of calcium or of phosphorus, as the case may be, over the amount bound as tricalcium phosphate. This distribution was assumed because according to the work of Holt *et al.*⁶ on the solubility relationship of calcium and phosphorus compounds to hydrogen-ion concentration, the pH values found were throughout too high to admit of the presence of the acid phosphates in appreciable quantities.

Considering the calcium bound as tricalcium

TABLE III.
DISTRIBUTION OF CALCIUM AND PHOSPHORUS IN INTESTINES OF RATS.
GRAMS PER GRAM OF TOTAL SOLIDS.

Region	Calcium			Phosphorus			
	No. Rats	As Tri-calcium Phosphate	Excess	No. Rats Inorganic	As Tri-calcium Phosphate	Inorganic Excess	No. Rats Organic
Rats on normal diet.							
A	18	.0052	.0	17	.0027	.0052	13
B	18	.0131	.0	17	.0068	.0013	17
C	21	.0227	.0131	20	.0117	.0	20
D	12	.0192	.0119	12	.0099	.0	12
E	20	.0200	.0130	12	.0103	.0	12
F	20	.0202	.0116	12	.0104	.0	8
Rats on rachitogenic diet. Inside.							
A	21	.0060	.0	18	.0031	.0040	14
B	21	.0128	.0005	17	.0066	.0	17
C	26	.0122	.0303	17	.0063	.0	15
D	16	.0105	.0270	10	.0054	.0	5
E	19	.0101	.0331	10	.0052	.0	10
F	15	.0062	.0381	5	.0032	.0	5
Rats on rachitogenic diet. Exposed to sunlight.							
A	13	.0053	.0	18	.0027	.0046	18
B	20	.0120	.0050	19	.0062	.0	19
C	25	.0114	.0186	21	.0059	.0	21
D	16	.0087	.0285	10	.0045	.0	8
E	16	.0045	.0327	10	.0023	.0	8
F	8	.0093	.0467	8	.0048	.0	8

phosphate, it is seen that in the small intestine the concentration is practically identical on the normal and the rachitogenic diets. This might reasonably indicate that practically all food has been absorbed or passed on into the large intestine and that the values are really those for the intestinal secretion. When the large intestine is considered, a comparison between the results obtained with rats on the normal diet and those on the rachitogenic is obviously of little value from the viewpoint of salt excretion since the intake of calcium and phosphorus was so different on the two diets. The two groups on the rachitogenic diet show no marked differences as regards calcium bound as tricalcium phosphate. On the other hand the amount of calcium not bound as tricalcium phosphate is much lower in the cæcum of the rats exposed to sunshine than in those kept inside. This may be taken as an indication either of increased absorption in the preceding small intestine or of a lessened excretion in the cæcum of calcium in some other form than tricalcium phosphate. We feel that this observation, that the difference in the calcium concentration in the large intestine of the two groups lies not with calcium bound to phosphate but in some other calcium compound is of considerable value, as it indicates that the calcium

absorption or excretion in relation to rickets may not be so intimately associated with the phosphorus as is now considered to be the case by the majority of investigators.

A consideration of the phosphorus concentration in the large intestine, whether in the inorganic form bound to calcium, or in the organic form, shows no essential differences between the rats exposed to sunshine and those inside. This lends further support to the view suggested by the calcium findings.

SUMMARY

1. Normal rats have an acid reaction in the beginning of the small intestine and the reaction becomes more alkaline throughout the tract. Rats on the rachitogenic diet, whether exposed to the sun or not, have a more alkaline reaction at the beginning of the small intestine than the normal rats. With those kept inside the reaction begins at once to increase in alkalinity. On the other hand in the rats exposed to sunshine the contents remain at practically the same reaction throughout the course of the intestines.

2. The total calcium content of the cæcum of rats fed on McCollum's rachitogenic diet and

kept inside was much higher than that of rats fed the same diet and exposed to sunshine.

3. The calcium bound with phosphorus was essentially the same in the cæcum of both groups of rats fed on the rachitogenic diet.

4. The difference in the calcium concentration in the cæcum in these two groups is thus due to calcium not bound with phosphorus.

5. No essential difference was found in the phosphorus concentration in the large intestines of the two groups of rats fed on the rachitogenic diet.

6. These observations suggest that the calcium

absorption or excretion in relation to rickets may not be so intimately associated with the phosphorus as is generally considered.

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CONSTIPATION, ITS CAUSE AND CORRECTION

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THERE are few, if any, better definitions of constipation than that given by Ludwig Kast,¹ in which he has expressed himself thus: "Constipation is a disturbance of intestinal function characterized by the insufficient or abnormally retarded elimination of intestinal contents." It is my intention to deal only with the so-called functional or idiopathic constipation, though it should always be remembered that careful consideration should first be given to determine whether or not the case in point is a member of this large group, or whether actual disease underlies the condition. If any doubt remains in the mind of the doctor, a careful elimination should be made of extrinsic causes, such as pressure, or organic diseases of the type of cholecystitis, chronic appendicitis, etc., to which constipation is reflex. Failing this, proctoscopic examination should be made and complete x-ray pictures be taken of the stomach, small bowel and colon.

The question of the importance of this symptom to the welfare of the patient next arises. Here we find a great diversity of opinion among authorities. Some claim that it is of the utmost importance, since it underlies so-called auto-intoxication; others believe that it bears directly on essential hypertension; while still others associate it with hypotension. There are those, on the other hand, who think that unless constipation occurs to a degree of severity approaching obstipation, it has little, if any, significance. Whatever one's opinion on the subject may be,

the question cannot be disputed that, in the mind of the layman, constipation assumes a most important rôle. Our daily newspapers are filled with advertisements for various patent preparations alleged to relieve or cure the condition. This indicates the position it occupies in the mind of the public. And, since we are, in a sense, the servants of the public, it is our duty to endeavour to deal with the condition intelligently.

Out of three hundred consecutive cases reviewed there were found to be one hundred and twenty-six who gave constipation as one of their complaints, that is, forty-two per cent. In addition to these, there were thirty-seven who, on being questioned, stated that they had had some trouble in this regard for many years. Thus, if such are included in our figures, the percentage is raised to fifty-four.

DIAGNOSIS

In diagnosing constipation the first essential is to ascertain whether or not the patient is truly constipated. Indication of this is found in the stools. The truly constipated will give a history of passing hard, dry faeces. Many patients are found who believe themselves to be suffering from this condition, who, on being questioned, report the stools as of normal consistency. This is not true constipation since, if there is a delay in the passage of the food residue in any section of the intestinal tract, fluid content must be lost, with the result noted. A more

accurate estimation may be arrived at by the administration of carmine, given in ten-grain capsules; the evidence of the excretion of this dye will occur in the normal individual within twenty-four to forty-eight hours and will be complete in seventy-two hours.

The old classification, spastic and atonic, is discarded by Erdheim,² though it would seem that it is still of service, if one remembers that there may be, in the one patient, a combination of the two types and that each large division is again subdivided into several branches. The stimulation of the vagus nerve results in increasing peristalsis which, peculiarly, may produce either diarrhoea or constipation, depending on the severity of the stimulation, since it may interfere with the normal peristalsis or may accelerate it. Stimulation of the splanchnic nerve, on the other hand, inhibits peristalsis. This nervous control is unquestionably influenced by the hormone derived from the mucosa of the intestinal tract, and it is probable that the spleen may also contribute further control.

Either type may be most accurately and readily diagnosed by a barium series; the atonic being shown by the large, somewhat relaxed colon with deepened haustra; the spastic by the small constricted lumen. Irregularities, however, may occur, with relaxation in one part followed by constriction without organic obstruction in another. This will complicate the picture and the treatment. It is neither desirable nor necessary to submit all patients to this expensive mode of diagnosing their condition. If, however, any possibility of organic disease exists, it is perhaps not out of place for us to stress again the importance of these measures.

The spastic type is usually found in the highly strung, so-called neurotic, individual, and in the great majority of these, the sigmoid colon, and sometimes even the entire colon, may resemble on palpation a firm, rope-like mass which is invariably tender. The atonic type, on the other hand, is usually found in the otherwise healthy individual, or in those showing characteristics of mild hypothyroidism (the lethargic variety). The colon of such is neither palpable nor tender. Boborygms is often noted and there is usually a lack of tone in the abdominal muscles, with a resulting visceroptosis. One is too prone, however, to diagnose visceroptosis as the cause of the associated constipation. Ludwig Kast feels that such is never the case, though it may occasionally be an irritating factor. Even

radiologists now hesitate to consider displaced or slightly kinked colons to be of great importance, without signs of associated disease producing this abnormality.

Rectal constipation is often allotted a separate classification, though it is actually an atonic form, readily diagnosed by proctoscopic examination, the rectum being found lax, distended, and usually full of hard, faecal masses. This may be caused by repeated enemata; by the presence of hæmorrhoids, with resulting tenesmus and consequent suppression of the act, first conscious and finally subconscious; or it may be predisposed by a congenital tightness of the anal sphincter.

Before dealing with the cases under consideration one might mention the possible complications of any one of these three forms. Colitis may result from damage to the intestinal wall, this alternating with constipation, though in such cases malignancy must be watched for particularly. Fissura in ano, pruritus ani, and hæmorrhoids must be added to the list. When one remembers that colonic ulcerations may in turn serve as a focus which may act like other foci in the body (though showing an apparent preference for the abdominal organs, the gall-bladder, appendix, kidneys, etc.) one is impressed still further with the importance of this subject which is too often lightly dismissed by many of us.

ETIOLOGY

Considering in somewhat greater detail the etiology of constipation, there are numerous factors to be considered, many of which are the direct result of our civilization. Even in pre-historic days when, in the process of development, man assumed the upright posture, gravity was given a greater chance to favour ptosis. This was further aided in a later stage of our existence by the increasing sedentary nature of our lives. But, as before explained, many patients with a marked degree of visceroptosis enjoy normal evacuations, and so this must be considered as only one possible link in the chain. In women, pregnancy would seem to produce an increased tendency to this complaint. Here, three factors may play a part; first, the general laxity and resultant weakness of the abdominal musculature; secondly, the common occurrence of hæmorrhoids at the time of, and preceding, labour, with the resultant tenesmus and subconscious suppression of desire; and, thirdly, the mechanical interference during the middle and latter months, with

subsequent habit formation. Lack of exercise, too, plays a part, though it is questionable if it is so great a factor as is popularly believed. Patients in hospital may be controlled without catharsis by a rational diet-combination of carbohydrates and fats. It is claimed, on the other hand, that postmen and policemen are inclined to constipation. Since none of such is included in our series we cannot contribute any figures on this point. However, we do find many farmers suffering from constipation. Their diet, as a rule, is adequate and wholesome, somewhat rough in type, supplying one would think, sufficient volume and residue; nor is there any lack of exercise in their lives. But, on investigating their history further, we find that on leaving the house in the morning they often spend the entire forenoon in the fields and on their return the optimum time for evacuation has passed. This might likewise apply to postmen and policemen.

The drinking of water is also of importance, though experience does not lead us to believe it to have so marked an effect on the bowel as is generally supposed. It is, without question, an excellent diuretic, and serves its part in carrying away the waste products of metabolism; but, few cases of constipation are cured by its use. A glass of hot water, taken on rising, may serve to stimulate intestinal peristalsis; following this the morning meal adds its effect, and the after-breakfast habit is in this way influenced by the morning draught.

It is claimed that blood pressure has a relation to colonic stasis. Alferez,³ however, in reporting one thousand cases of essential hypertension, finds that only forty-six per cent give this symptom, this being no higher than the percentage found in this clinic of all patients. Low blood-pressure, likewise, has little demonstrable relationship to constipation. Only thirty-nine per cent of the cases here reported showed a systolic blood pressure of less than one hundred and fifteen, thus leaving the great majority of patients well within the normal range.

Sex also seems to be of importance, since forty-six per cent females, compared with thirty-seven per cent males, complained of constipation. No doubt the difference is explained, to some extent at least, by the process of child-bearing and labour.

Age, too, is a contributing factor, due in part to a changed manner of living, but principally to the physical changes that are undergone with

the advance of years, the weakening of the musculature, and the general loss in elasticity of the body tissue. Unfortunately, our group does not illustrate this point, as the majority of these patients varied in age from twenty-five to fifty-five years of age.

Some members of the medical profession feel that the endocrine glands play an important part, their secretions acting directly through the nervous mechanism. Of these, the pituitary and the thyroid seem to be the most important, and though at this time endocrinology is in its infancy, and the tendency is to find in these the hypothetical source of any trouble of which the true nature is veiled in obscurity, yet we are forced to admit the possibility of this influence. All cases of intestinal stasis do not show signs of glandular hypofunction, but one rarely finds a patient giving evidence of hypothyroidism, by lowered basal metabolism, slow pulse, low blood pressure, etc., who does not include in his list of complaints faulty evacuation of the bowel. It is also true that such patients respond marvellously to treatment directed along these lines, the administration of the glandular extract often being in itself sufficient to control the condition after the preliminary restoration of normal function.

The last factor to be considered is one of the greatest, if not the greatest contributing cause of constipation, that is, the practice of habitual catharsis. Mothers, anxious for the welfare of their children, start the regular administration of pills, castor oil, salts and similar laxatives at an early age. In many cases it is a hard and fast rule that Friday night is the regular time for such medications, entirely unmindful of any need for such measures. Thus, the habit is established in the young, and too often, as time passes, it apparently becomes a necessity. Cathartics are perhaps among the most constipating medications that one can take and should be used only as emergency measures. The same remark applies to enemata. This practice is fortunately not so widely indulged in in Canada as in many parts of the United States. Enemata have their purpose, but to educate people to believe that they require "internal baths," as they are called by their ardent supporters, as frequently as they require external bathing, is absolute folly.

SYMPTOMATOLOGY

Discussing the symptomatology of stasis with

any degree of accuracy is a matter of some difficulty, and yet there is a certain sameness that occurs with persistence in such cases, making it safe to assume that there is a definite relationship between these common features and constipation. Such are:—A history of fullness after meals; belching of gas a variable time after food; vague abdominal discomfort; often dull, aching pain in the lower left quadrant; sometimes a similar discomfort in the right lower quadrant, suggesting on examination chronic appendicitis, though no history of an acute attack is obtained. Headaches are common. Anorexia, foul breath, coated tongue, occasional nausea, are complained of, and sometimes regurgitation of food after meals. Abdominal cramps, borborygmus, pain in the back, etc., may be added to this list. In practically all cases where the gastric acidity is normal and there is no associated organic disease, these symptoms greatly improve or disappear with proper control of the bowels.

The complaints generally associated with constipation, such as tiring readily, exhaustion, nervousness, lack of reserve energy, dizziness, palpitation, etc., are not, however, so amenable to treatment. Constipation is almost invariably found associated with migraine, and is also present in the majority of cases of epilepsy. When the normal intestinal function is restored there is usually some improvement in the symptom complex, but as it can be classed only as an improvement, one is forced to conclude that it is but one of several factors at work.

TREATMENT

And now, in conclusion, a word must be said as to treatment. No set rules can be applied as a routine, since the procedure to be adopted must of necessity vary materially with the type and with the cause in each individual case. We have indicated certain measures throughout. Unquestionably, a normal healthy life is essential, paying particular attention to the regularity of one's habits, to meals and hours of sleep. A glass of water on rising has certain benefits, the mechanism of which we previously explained. The time for going to stool should be definite and the optimum is, without doubt, immediately following the morning meal. The position at stool is important, the knees well flexed on the abdomen. The diet is most essential. There are few patients with functional constipation who will not in time be able to carry on normally on a diet rich in carbohydrates

such as fresh and stewed fruits, figs, prunes, green vegetables, sugar, etc. Roughage may be obtained through whole wheat bread, bran muffins, etc. As a rule, tea, cheese and excessive meat-eating should be avoided. Excesses of fatty foods should likewise be eliminated, though it is interesting to note in this regard that Florence H. Smith⁴ reports excellent results in the treatment of constipation by high fat feedings. Her prescribed diet consists in protein 66, carbohydrates 164, fat 224, which she states will control even the most persistent cases in three to five days, though she reports that a very occasional patient has resisted treatment for as long as three months. Psyllium seeds, flax seeds, bran, etc., are of marked benefit in many cases, supplying the necessary bulk for stimulation of peristalsis. Yet, these should be introduced with care in the case of patients who have been on soft bland diet for long periods, as they may by this sudden radical change be markedly upset, and the co-operation and confidence of the patient is lost before treatment is well inaugurated. Cathartics, enemas, etc., should be discontinued, though in the most obstinate cases it is impossible to suddenly accomplish this. A little cascara may be given primarily, but the importance of gradually diminishing this cannot be over-stressed. Small retention oil enemas are often useful in the presence of hard, impacted faeces, such as are found in rectal constipation. Soap-suds enemas of the usual type should only be used when absolutely necessary.

Massage, while used by many, does not find a supporter in Soper.⁵ The purpose of this massage is to stimulate peristalsis. It is questionable if it accomplishes this, and undoubtedly the intake of food forms a much more reliable stimulant. It is, however, still employed by many physicians, the massage following the lines of the colon and being of a gentle rotary nature. Even by this procedure, there have been several cases reported in which damage to underlying diseased organs has resulted. However, we are presupposing that such disease has already been carefully eliminated.

Mineral oil is our greatest ally in combating constipation, being second only to dietetic measures. This, too, however, has its disadvantages, producing at times a seepage from the rectum which is found embarrassing to the patient. Fortunately, however, in its emulsified form this disadvantage is largely overcome, and we have in many cases found it of the greatest value com-

bined with the old-time remedy, agar-agar. Several patients have recently asked whether there is any danger in the use of mineral oil as a causative factor in the production of cancer. This idea must have been obtained from some published article, but we were unsuccessful in finding anything dealing with this subject. Perhaps the idea arose from a paper by Robert Gibson⁶ in which he pointed out that seepage may produce an eczema about the anus which might in time assume a cancerous nature. However, he cited no case in which it had done so, and, as the seepage may be controlled by the use of the emulsion, it would seem safe to overlook this theory as a possible contra-indication until more material evidence is produced to support it.

In conclusion, certain drugs may prove useful

in chosen cases. Belladonna is an excellent adjunct to the treatment of the spastic type; similarly, bromides and luminal are found to have a favourable effect on the psycho-neurotic patient; pituitrin is useful in those giving signs of atonic constipation; thyroid extract, which we merely mention, having dealt with it previously; and olive oil which is useful in the undernourished type, in the absence of any suggestion of an associated cholecystitis.

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LEAD POISONING IN BRONZE FOUNDRIES*

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THE occurrence of lead poisoning among bronze foundrymen cannot be very uncommon, yet the medical literature seems to be devoid of references to the subject. The United States Bureau of Labor Statistics, in its *Bulletin No. 306*,¹ which lists in tabular form the various occupations and their hazards, has not infrequently been accused of excessive zeal in associating lead poisoning with occupations where its occurrence is of academic interest only. This *Bulletin* mentions the hazard of lead poisoning in brass foundries, but does not include bronze foundries in the lead group. We have searched most of the text-books on industrial hygiene, and the various medical indexes, but have failed to find any reference to lead poisoning among bronze foundrymen. This is all the more strange since many laymen and quite a number of physicians are well aware of the hazard. During the past six months we have had the opportunity of seeing some ten cases of lead poisoning among bronze foundrymen, and have seen a number of other bronze foundrymen who showed very suggestive signs of lead poisoning, either in the Burtonian line or in the presence of basophilic stippling.

The clinical histories of these ten active cases present little of note. They were all more or less typical cases of plumbism, showing the blue line in the gums, stippling of the red blood cells, and lead in the urine, and complaining of severe abdominal pain and constipation. Several of them were considered sick enough to be admitted to the wards of the Montreal General Hospital, but none showed any of the distressing complications of palsy or encephalopathy. Most of the cases returned to their old work when their symptoms had been relieved and they had been placed on a lead-eliminating régime for a few weeks.

True bronze is an alloy of copper and tin, but other elements may enter into the alloy, such as aluminum, phosphorus and lead. Not infrequently brass, containing no tin at all, is loosely spoken of as bronze. Books to which the medical reader has ready access do not speak of lead as a common constituent of bronze. The usually reliable *Encyclopædia Britannica* mentions the possibility of traces of lead in statuary bronze, but does not refer to its presence in other bronzes. As a matter of fact lead is a common constituent of bronze, particularly of the so-called "railroad bronze," where its presence, at first accidental, is now considered very desirable. The piston packing-rings of locomotives contain

* From the Industrial Clinic, Montreal General Hospital, and the Department of Metallurgical Engineering, McGill University.

nominally 50 per cent lead and 50 per cent copper. They are usually called bronze. Bearing metal contains from 12 to 20 per cent lead, because of the anti-frictional qualities of the metal. Roast and Newell,² in a recent paper, give the analyses of several bronze bearing-Metals. Two of these contain 15 per cent of lead and one 10 per cent. For the car journal bearings of the Pennsylvania Railroad at least 13 per cent lead is called for and one special high lead bronze contains 25 per cent.¹¹ A typical analysis of railroad bronze (supplied by the Operation Department, Motive Power and Car Equipment Sections, Canadian National Railways) is as follows:

	Per Cent
Lead	15 to 22
Tin	5 to 7
Total of lead, tin and copper, minimum	97
Remainder, including zinc, maximum	3
Remainder, excluding zinc, maximum	1

EXPERIMENTAL CONSIDERATIONS

That molten metallic lead gives off visible fumes when at an "orange heat" or above it is obvious enough to those who work with it, but it seemed to the authors desirable to obtain some quantitative evidence on the question of its volatility. Reference tables give the boiling point of pure lead variously as from 1550°C. to 1640°C. Even the lower and more probable of these temperatures is a dazzling white heat, far beyond any temperature to which any lead-bearing alloy is ever heated, and beyond the temperatures at which the products of lead smelting furnaces are produced. Also, according to Schenck and Dean,³ the vapour pressure of lead falls very rapidly with the temperature, as shown by the following figures:

Pressure, mm. Hg.

760: 100: 50: 10: 1: 10⁻¹: 10⁻²: 10⁻³.

Temperature, deg. C.

1640: 1360: 1290: 1130: 960: 820: 710: 620.

Nevertheless, as mentioned above, if lead is heated to a temperature of 900°C. or more, and if the lead oxide formed is continuously removed, as by absorption in a porous vessel, or by a blast as in the process of cupellation, the lead is seen to produce fumes.

A similar condition exists during the casting of bronzes that contain much lead. These alloys have a high melting point, because the melting point of the copper is only slightly lowered by the lead and the comparatively small amounts of

tin and other metals that may be present. Indeed, the copper-lead mixture may be described as more of an emulsion than a true alloy, so slight is the affinity between these metals, and special skill is required to get good results in the founding of high-lead bronzes. The pouring temperature of these bronzes is from 1040°C. to 1150°C.

While being melted the bronze is in a closed furnace and, further, the metal in the crucible is covered with a slag that checks volatilization, but while the castings are being poured the metal in the crucible or ladle is kept skimmed more or less clean, and the stream of molten metal itself is continuously clean. Thus we have conditions quite similar to those under which cupellation is conducted, and fumes or "smoke" of oxidized lead vapour proceed from the hot bronze and circulate through the foundry, unless suitable draft arrangements are provided to remove them.

The boiling points of copper and tin are both much higher than that of lead, namely 2310°C. and 2275°C. respectively, and the bronzes in question are free or very low in zinc, (which is volatile), so it seems evident enough that we are getting lead fumes under the circumstances described. However, to get a quantitative idea of what the observed smoke represents, the following preliminary experiments were carried out.

Experiment A.—Two grades of standard lead-bronze were used: (1) railway journal bearing bronze, containing about 15 per cent lead; and (2) piston packing-ring metal nominally 50-50 copper-lead. Part of both lots was kept for analysis. For heating, the alloys were contained in crucibles made by drilling a 1-inch hole in a cylinder of pure, solid graphite (round electrode). The surface of molten metal in this crucible would have an area of, say, 0.79 sq. ins., because the surface tension produces a convex surface. The crucibles were charged into a furnace, and fired with gas and air already heated to a temperature of about 825°C. Temperature was measured with a Leeds and Northrup optical pyrometer.

The heat was gradually increased, care being taken to maintain a strongly reducing flame, until at the end of an hour the temperature was 1150°C., and the surfaces of the molten alloys were clean and mirror-like, practically all over. At the end of two hours the temperature was

about 1250°C. and was then somewhat reduced. After another twenty minutes' heating, the crucibles were removed and quickly cooled by a jet of gas, preventing any but very slight surface oxidation of the alloys. The alloys were weighed and analysed, with the following results:

		Weight of alloy	Analysis*	Weight of lead
A-1 Journal Bearing		gm.	per cent Pb.	gm.
Before	.....	107.931	14.02	15.132
After	.....	105.809	12.40	13.120
		2.122		2.012
A-2 Ring Metal		gm.	per cent Pb.	gm.
Before	.....	50.846	57.73	29.35
After	.....	49.222	55.1	27.9
		1.624	58.8	1.45

The agreement in the results on the bearing bronze (A-1) is as close as could be expected; possibly a full analysis would explain the small discrepancy by showing a loss of zinc. In the case of the ring-metal (A-2) the agreement is not so good, because of the difficulty in getting a true sample of the alloy, which is very liable to segregation. Why the loss in this case is so much less than in case A-1 we cannot definitely explain. There would be more or less complete liquation as the alloy fused, resulting in a layer of lead below and a layer of copper above; the copper having no tin content (as most other bronzes have) dissolves very little lead, and with a lower lead concentration at the surface we have less volatilization.

Experiment B.—A weighed amount of pure commercial lead was heated in an ordinary plumbago crucible (graphite-clay mixture) during the latter part of the furnace treatment described under experiment A. The charge was put in when the furnace was about 1200°C. and was heated for forty minutes, then was cooled under a gas jet. An empty control crucible of the same kind was heated along with it, but was not needed, as the lead came out easily after heating. The results are as follows:

		Control Crucible	Charge	Loaded Crucible	Lead
		gm.	gm.	gm.	gm.
Before	.....	81.448	162.224	86.458	75.766
After	.....	80.274	159.649	85.055	74.534
Loss	.....	1.174	2.575	1.403	1.232
			1.403		
Loss of lead ..			1.172		1.232

* Analysis by J. T. Donald & Co., Montreal, Que.

The exposed area of the lead in this case was 1.23 square inches. The loss is comparable with that in experiment A-1, which was in the furnace much longer, thus:

Disregarding temperature, which averaged higher for B than for A, and calculating the loss of lead per square inch per minute, we have;

		Loss Pb/sq. in./min.
Bronze (A-1)	.....	0.019 gm.
Pure lead (B)	.....	0.025 gm.

This is a reasonable concordance, considering the temperature difference.

OBSERVATIONS IN A FOUNDRY

In order to apply the results of the preliminary laboratory experiments described above, observations were made in a representative bronze foundry during one afternoon's casting operations.

At the time, melting was being done in several gas-fired one-pot crucible furnaces. The gas flames escaped directly into the melting room, coloured green by copper, but there was no sign of lead smoke from this source. Normally in this foundry the large output of lead-carrying railway bearing bronze is melted in a completely closed electric arc furnace, 1,000 pounds at a time. The gas furnace crucibles hold about 350 pounds each; two or more crucible melts are combined in a large ladle for large castings. The output of the foundry is from 10,000 to 15,000 pounds per day.

The crucibles of molten alloy as they come from the melting furnace are covered with dross produced from dirt and sand on scrap metal, oxide, etc., and fume very little. The dross is skimmed off and the alloy immediately produces a cloud of fume, or "smoke." In the case of "phosphor-bronze" the surface remains clean and continues to fume; apparently the oxygen at the surface of the metal selects the phosphorus (which is there for that purpose) and the fume probably consists largely of phosphorus pentoxide, but if the alloy contained any considerable amount of lead it would volatilize and go off as oxide also. Usually phosphor-bronzes are low in lead. On the other hand, non-phosphoric bronze (lead-carrying "acid resisting" bronze was observed on the day in question) seams over with a film of oxide very quickly after being skimmed, and

then fumes very little from the surface in the crucible, but copiously from the stream of alloy as it runs into the mould. High-zinc brasses fume very badly owing to the volatility of the zinc; and "ornamental yellow" brass may contain considerable lead, but "manganese bronze" (really high-zinc brass) is free from it. "Steam metal," containing 5 per cent each of tin, zinc and lead, we would expect to have intermediate properties.

Several observations were made of the time required to pour a crucible of alloy, including the time the stream of clean, fuming metal is actually running into the mould, and the total time a crucible is in hand. These times vary with the size of the castings being poured, and other factors, but average about three minutes and six minutes respectively.

In regard to the surface exposed: we would estimate, say, twenty-five square inches for six minutes for the partly skimmed, slightly fuming surface in the crucible; and the equivalent of a cylinder three inches in circumference and eight inches long, say, another twenty-five square inches for three minutes for the stream running into the mould.

Using our figure 0.02 grm. loss of lead per square inch per minute, we find that 4.5 grm. of lead are discharged into the atmosphere of the casting room in the six minutes required to dispose of each 350 pounds of alloy. Assuming a room fifteen metres square and five metres high, and no circulation of fresh air, we have a concentration of four mgm. of lead per cubic metre of air. There is, of course, a circulation of fresh air, but the draft is quite likely to carry the concentrated fumes directly toward one of the workmen handling the crucible.

PREVENTION

In order that we may formulate an intelligent program for the prevention of lead poisoning in foundries certain fundamental facts should be known.

1. What is the dangerous concentration of lead fume in the air?

2. How much lead can be absorbed daily by an average man with comparative safety?

3. What percentage of inhaled fume or dust is retained?

With regard to the first two questions our knowledge is admittedly inaccurate, for any

investigator is handicapped by the difficulty of getting human subjects to experiment upon, and experiments on animals cannot be considered strictly applicable to human beings. Legge^{4,5} has estimated that with a concentration of 0.5 mgm. of lead per cubic metre of air men will rarely develop colic and never encephalopathy. Teleky^{4,5} believes that a daily dose of a little more than 1 mgm. of lead over a period of several months will cause plumbism.

The third question as to what percentage of inhaled fume or dust is retained, has recently been considered by Drinker, Thomson and Finn.⁶ These authors, using human subjects, experimented with zinc oxide fume (particle size about 0.4 micron), zinc oxide powder, ["Kadox" (particle size about 0.15 micron)], and marble dust (particles varying from 0.3 to 6.0 microns). Their determinations were remarkably uniform. For the zinc oxide fume the percentage of dust retained averaged 57 (± 10.8); for the "Kadox" the percentage averaged 56 (± 7.3); and for the marble dust the percentage figure was 54 (± 9.2). The average percentage retention of the three was 55, with a probable error of ± 9 . We believe that these determinations are as accurate as it is possible to obtain, considering the rather marked variability in different subjects, but it is only fair to state that Lehmann, Saito, and Gforer⁷ in 1912 obtained a much higher percentage retention with white lead dust. However, since the experiments of Drinker *et al.* were with fume and more nearly fit our present problem, we are inclined to accept their results.

If we assume, therefore, that approximately 50 per cent of inhaled dust and fume is retained, we find that the concentration figure of 0.5 mgm. per cubic metre of Legge, and the dosage figure of 1 mgm. per day of Teleky, check rather well. If the tidal air of an average man is 500 c.c. and sixteen respirations are taken per minute, the amount of air inhaled by a man during eight hours is 3.84 cubic metres. At a concentration of 0.5 mgm. per cubic metre 1.92 mgm. of lead are inhaled and 0.96 retained, which corroborates Teleky's figure very well.

The prevention of lead poisoning in foundries, or anywhere else, for that matter, resolves itself into the problem of preventing the workmen from inhaling more than a toxic amount of

lead per day. For the purpose of our calculations we have accepted the statement that 1 mgm. of lead per day is the maximum dose allowable.*

From the calculations given earlier it will be seen that when a crucible with a 350 pound charge of lead alloy is poured, probably 4.5 gm. of lead are discharged into the atmosphere. At the point of discharge the fumes are very concentrated and may be directly inhaled if they happen to blow toward the men doing the pouring. When the fume has been distributed throughout a room of the size mentioned (1125 cubic metres) the concentration becomes 4 mgm. of lead per cubic metre. Through leakage this concentration will gradually become less and less until the time of the next pouring when a fresh charge of lead is introduced into the room, and the cycle starts again. We have not had facilities for making actual determinations of the lead concentration in the air, and we doubt whether they would be of great value on account of the difficulty in obtaining representative samples. We are assuming that the maximum concentration of lead in the room under consideration varies from 4 mgm. per cubic metre to zero concentration, with an average concentration of 2 mgm. per cubic metre. That is, we are assuming that under the worst conditions (namely, in winter when the windows are closed) the men in the moulding room are constantly exposed to an atmosphere averaging 2 mgm. of lead per cubic metre of air. This, according to Legge, is at least four times the safe concentration. Under these conditions the problem is to prevent the men from absorbing 1 mgm. of lead per day.

PROPHYLAXIS

Masks.—In regard to masks it may be said at the outset that it is very difficult to get men to wear them for eight hours a day. In the presence of dust and heat masks become very uncomfortable, and at best they should be looked upon as a last resort. Furthermore, it is questionable whether the average commercial mask (such as the so-called pig-snout mask) is of much value in the presence of very fine fumes.

Brown,⁸ in his study of lead poisoning among men working at the scrapping of naval vessels, where the lead in the paint is volatilized by the

oxy-acetylene torch, states that experimentally the Burrell modified industrial mask, with type GMC-1 canister, proved to be the most satisfactory of several masks tested. The canister, which is connected to the mask by a flexible hose, contained four absorptive layers; soda-lime-charcoal; cotton; soda-lime; charcoal. This mask appeared to retain the lead fume when tested in the laboratory, but "it failed to reduce the incidence of plumbism." Barreto, Drinker, Finn, and Thomson⁹ state that if the original Burrell dust mask is impregnated first with a fine fume like zinc oxide its efficiency becomes quite high. The Burrell dust mask consists of a face-piece connected to the dust filter by a non-collapsible hose. The filtering medium is large in area (approximately 84.0 square inches).

The Mines Safety Appliance Company's standard mask, type M-S-A, which depends on furnishing the man with pure air through a hose connection, might be expected to furnish good protection. It would not be practicable to have men wear this type of mask with unwieldy hose connections at foundry work, however.

It is our belief that it is not reasonable to require men to wear respirators all day long at their work, and that some other method of protection should be devised.

Ventilation.—It might be practicable to dilute the lead fumes to a safe concentration by the introduction of outside air. As a matter of fact this is what appears to happen in summer, for there can be little doubt that the incidence of lead poisoning in bronze foundries is greatly reduced in summer when the windows are wide open.

If we assume that 350 pounds of lead alloy are poured every hour, according to our calculations 4.5 gm. of lead are discharged into the atmosphere at each pouring. To dilute this to 0.5 mgm. per cubic metre of air, 9,000 cubic metres of air per hour will be required. This is equivalent to 5100 cubic feet of air per minute. This is a high calculation since we have made no allowance for natural ventilation. A properly designed fan of less than two horsepower could supply 5100 cubic feet of air per minute.¹⁰ The running expenses would be chiefly in the heating of the air and should not be high, for the normal problem in a foundry is one of cooling

rather than heating. With a plenum system of ventilation the air should be delivered through multiple ducts in various parts of the room, but concentrated chiefly about the moulds. It should enter the room at about the head level. With the introduction of large quantities of air to a relatively small room, exhaust fans may be required. If the room is large, however, and the ceiling high with a monitor roof, the delivered air can find ready escape. In connection with the use of exhaust fans, there seems to be an impression among foremen and others that their installation in side walls or roofs solves the problem of ventilation. Such fans draw their air locally, they exert a negligible suction at a distance of more than ten feet, and to expect an ordinary exhaust fan to remove fumes from a moulding operation many feet away is unreasonable.

The furnaces should be equipped with hoods connected with exhaust fans. The degree of volatilization of lead is probably not high at the furnaces on account of the dross covering the molten metal, but doubtless some fumes escape and the problem of removing them at this point is not difficult. It may be practicable to remove the fumes over some of the moulds by local exhaust ducts, and in the foundry where most of our observations were made this has been done in the case of the piston packing-rings. In many moulding operations the use of local exhaust ducts is hardly practicable, for in order to make them effective they must be placed close to the moulds and this is likely to interfere with the movements of the moulders.

It is universal knowledge that certain individuals are much more susceptible to lead poisoning than others, and in the presence of relatively small amounts of lead will develop poisoning. To eliminate these, and to keep an accurate check on all the workmen, the men who are exposed to the risk of plumbism should be periodically inspected by a physician who is qualified to detect the early signs of the disease. Such an inspection should be carried on at least twice a month, and preferably weekly.

Milk should be furnished to the men. It is a time-honoured preventive of lead poisoning and there is a rational basis for its use.

We subscribe to the view that most of the lead is absorbed through inhalation rather than ingestion. Nevertheless other routes of absorption should not be neglected. To reduce the chances of swallowing lead, provision should be made for eating away from the moulding room, and facilities for washing should be provided. Smoking and chewing should be forbidden while at work.

SUMMARY

Ten cases of lead poisoning which we have seen recently are reported, not because they present anything of unusual interest from the clinical standpoint, but because they occurred among bronze founders.

It is not universally known that bronze frequently contains lead, sometimes in large amounts, and that in the melting operation a very high temperature is reached, high enough to cause considerable volatilization.

We have determined the volatility of lead from bronze at the temperature at which it is treated for casting (2100°F.), and find that it is in the neighbourhood of 0.020 grm. per square inch of molten surface per minute.

Calculations are given as to how much lead is probably volatilized during the operation of pouring the metal into moulds, and suggestions are made as to how this lead fume may be removed or diluted, so as to reduce the hazard of plumbism, which is often very great.

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WHAT IS A PÆDIATRIST?*

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DEFINITION.—Originally a pædiatrist was one who, with reasonably good mental equipment, had sacrificed his time and money in such prolonged study and experience in children's diseases that he could in all honesty offer to practise in that line only, and, by giving unusually complete and scientific examination with treatment to his patients, deserve an honest, high reputation in the minds of his patients and of his confrères as a genuine specialist in his chosen branch. Are these the qualifications of all or most men who are to-day crowding into the ranks of specialists, and are we doing our share to prevent the name of pædiatrist being debased as much as "professor" or even "doctor" or "specialist" have been in the past by unscrupulous people?

With haste and disregard of correct spelling, the overwhelming majority of us, even in universities and hospitals, are too utterly careless of scholarship to preserve the diphthong in "pædiatrics" as if we did not know that "pæd" is a Greek root meaning "child," and "ped" is a Latin root meaning "foot." Hence, one has been sincerely asked by laymen evidently better educated than we are if pædiatrists are not foot or corn specialists. With paradoxical action, while the first syllable has been shortened, the word has been lengthened, with a love for long resounding words, into pædiatrician, with very doubtful gain.

Is Pædiatrics a Specialty?—This might be answered from the point of view of either (a) the faculty, (b) the practitioner, or (c) the patient.

(a) There are still those who hold that pædiatrics is merely a part of clinical medicine, calling for no division either in college or hospital. Such men are not interested in the diseases, chiefly functional, of young infants any more than they are keen to bother about the

heavy mortality of "summer diarrhœa", and yet they prevent competent, trained men doing so through academic channels. But this has been amply, if tardily, corrected by at least our large universities and need not detain us here, except to confirm the claim that from the academic point of view, pædiatrics is a special branch, certainly in regard to children up to about ten years of age.

(b) Practitioners have shown less delay in seeking consultants' aid and have long recognized the specialty, not only as a means of sharing responsibility in moribund cases, but also for the benefit of their patients, even if, as all specialists complain, they do not seek our aid as early as we think they should.

(c) The patients, at least the youngest and most liable to fatal disease, cannot speak for themselves, but, of course, it is the patients who should settle the question whether the community needs a specialist for sick children. It is safe to say to a pædiatric audience that the last two decades have amply proved that the pædiatrist, even from economic and political points of view (e.g., in vital statistics), has emphatically won a position of value to the public.

If then, we are dealing with a genuine specialty, why notice the odd delinquent who would enter the ranks without fair preparation? All branches of activity have such black sheep. Only because the hard-won good name of pædiatrics has been gravely threatened by the increasing numbers of men who pose as pædiatrists and demand specialists' fees without honestly fitting themselves for their work by any fair amount of study or experience. In writing so, one is not citing conditions only in one's own home city or province, or country. Information comes chiefly from clear-headed general practitioners, chatting at medical conventions of conditions all over Canada and in many parts of the United States. Many men go away to one hospital in one city only, for

* Read at the annual meeting of the Canadian Society for the Study of Diseases of Children, at Vancouver, June 29, 1928.

several months, others for weeks only (!) and return "specialists" though scandalous and dangerous men. Men have left another specialty to become pædiatrists over night; others, after being general practitioners, become "pædiatrists" with no special training whatever. One would not mention this, were not some such men at once welcomed in and appointed to universities and hospitals which thus countenance and encourage the untrained "specialists." Another source of information is the kind of treatment a consultant meets and which must result from hopelessly scant training.

The Remedy.—One might be thought pharisaical in appointing himself a judge over his confrères; certainly, his writing would be utterly futile unless he had very practical suggestions as to the prevention or cure of this condition. While the motive of this little paper is to call attention to the present menace to the good name of pædiatrics, our only justification lies in making the following practical suggestions.

SUMMARY

1. The good name of pædiatrics is, to a very great extent, in the hands of those who appoint doctors to teaching posts in the universities, to clinical posts in hospitals, and who give permission to work in clinics.
2. Let us accept only those with at least good average ability. Men have gone away to study for a specialty, who from lack of ability, could never by any amount of study become real specialists.
3. Appoint those only who can and will study for a year or two in this line.
4. Favour those who have had several years' training in general medicine in hospital, or better, in several years' practice.
5. Insist on prolonged industrious study in at least three large pædiatric clinics.
6. Favour those who have studied in Europe as well as in America.
7. Heartily support and encourage those who will sacrifice time and money in so preparing themselves for respectable and honourable special practice.

The Influence of the Crusaders in Medicine.—"Between the years 1095 and 1270 A.D., Europe was rocked by the militant Crusaders. Morbid religious faith, working upon a disturbed nervous system, caused people to have distorted views of life and made them fall an easy prey to the adventurers who stirred up crusading expeditions. The travelling crusaders represented all types of people and as they advanced by slow marches, begging food and clothing as they went, they spread disease in every community they came in contact with, and prepared the way for countless epidemics. The sickness promoted by the crusaders gave wide scope for the exercise of medical skill.

"Roger, King of Sicily, published an ordinance compelling physicians to be registered by the district magistrates, after suitable examinations, and the schools of Salerno and Naples were designated the only colleges for the instruction of qualified physicians. This ordinance appears to have been effective in improving the status of medical men, because we find such men as Albertus Magnus (1193-1280), Vincent de Beauvais (1221-1264), Hugo de St. Victoire (1087-1140), Thomas Aquinas (1225-1274), and Roger Bacon (1214-1292) becoming active in medicine. These were all college trained doctors and well rounded scholars who did valiant work in uplifting medicine. We may

say, therefore, that the crusaders, while spreading serious epidemics of disease, and causing much sickness, turned public attention to the need of medical schools and better medical education. These benefits must be credited to them, as well as the establishment of hospitals, poorhouses, baths, and asylums throughout Europe."—*The Physician Throughout the Ages*, New York, Capeheart Brown Co.

Synthetic Substitute for Ephedrine.—With the comparatively simple and inexpensive synthesis of phenylethanolamine sulphate by a new method, Hyman Miller and George Piness, say they have at hand a drug comparable pharmacologically to ephedrine but considerably less toxic. Clinical evidence points to the inactivity of phenylethanolamine sulphate on oral administration, and to an advantageously weak pressor but disappointingly weak bronchodilator effect on hypodermic injection. The field of the greatest usefulness of phenylethanolamine sulphate in therapeutics is apparently as a topical application in the nose, in which its activity is in every way comparable to that of ephedrine. The addition of a new drug to the already overcrowded pharmacopeia requires considerable justification. This justification, they believe, may well be found in the evidence here presented.—*J. Am. M. Ass.*, 1928, xci, 1033.

Case Reports

PERNICIOUS VOMITING OF PREGNANCY, WITH AUTOPSY FINDINGS*

BY S. KOBRINSKY, M.D.,

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Mrs. A. G., French Canadian, Roman Catholic, aged 26, was admitted to St. Boniface Hospital on May 19, 1928, on account of persistent vomiting.

Family History.—Her father, mother, nine sisters, and three brothers are alive and well. Two sisters died from pernicious vomiting of pregnancy; one at the age of 19, when her first pregnancy was advanced to 2½ months; the other at 26, in the third month of her fourth pregnancy.

Personal History.—The past history was negative save for an attack of influenza in 1918, when she was ill one week. Menstruation began at 14. It was regular every twenty-eight days and lasted four to five days, not profuse nor accompanied by dysmenorrhœa. She was married in November, 1927, and her last menstrual period began March 9, 1928.

History of Illness.—She felt fairly well until the end of April when she began to have pronounced nausea and vomiting, chiefly in the morning. This condition grew worse and was aggravated by severe headaches. From May 14th, she was unable to retain any food taken by mouth.

Physical Examination.—A fairly well nourished young woman. The heart and lungs were negative. The fundus uteri could be palpated just above the symphysis. Blood pressure was 128-90. Urinalysis: albumen and sugar not present; acetone +++; diacetic acid +; pus +.

The treatment consisted in absolute rest in bed; nutrient enemata; 500 c.c. of 10 per cent dextrose intravenously daily, with 20 units of insulin.

Some improvement was noted, and on May 24th the acetone and diacetic acid had dis-

appeared from the urine, but albumen, hyaline casts, red blood cells and bile were present. The icterus index was 27; van den Bergh's reaction, immediate direct. Evacuation of the uterus was considered.

On May 26th Dr. Lennox Arthur saw the patient in consultation. Following this, evacuation of the uterus was advised, but consent could not be obtained. In addition to the dextrose, 25 c.c. of 10 per cent magnesium sulphate was administered intravenously every two hours for two days; later, three times a day. Again there was apparent improvement and she was able to retain some fluids by mouth. On June 4th, the icterus index was 17; the urine, however, contained a trace of albumen, acetone and occasional casts. Three days later she grew much worse.

Urinalysis: acetone, a trace; diacetic and albumen, a faint trace; hyaline casts present. Blood urea nitrogen was 14 (normal). In spite of treatment she became comatose and died on June 13th.

An autopsy was performed by Dr. Jas. Prendergast, pathologist to the hospital, on June 14th.

Post Mortem Findings.—Lungs showed congestion of their bases with moderate œdema. The pericardial sac and heart were negative.

The peritoneal cavity was dry. The alimentary tract was distended with gas, but the serosa and mucosa showed no gross changes. The pancreas was negative. The spleen somewhat small but soft, the pulp a pale red. The gall bladder had a distended wall of normal thickness, but the lining showed a definite strawberry appearance; background was pale yellowish and green in colour; no calculi. The liver was rather small weighing 1380 gm., softer and more friable than normal, of a uniform very pale colour and of homogeneous texture, without any signs of hæmorrhage. Kidneys; left, 125 gm., right, 120 gm. Both were alike in appearance, quite congested, with smooth surface; the capsule stripped easily. Adrenals: well developed and apparently normal. Ureters and bladder were negative.

* From the Department of Obstetrics, St. Boniface Hospital.

The uterus was the size of a large orange and soft. It contained an apparently healthy fetus (the history pointed to a three months' pregnancy).

Microscopical Examination.—The predominating feature in the kidneys was the marked tubular changes, parenchymatous or cloudy swelling; the glomerular apparatus was intact. The appearances were those of the nephrosis of pregnancy.

The liver showed no microscopical hæmorrhages; no cellular infiltration. Cloudy swelling was present. There was also some fatty degeneration, but this process was by no means general. The gall bladder (strawberry), spleen, adrenals, pancreas, ovaries showed nothing peculiar.

SUMMARY

A fatal case of pernicious vomiting of pregnancy in an apparently healthy young woman.

Death of two sisters from the same cause.

Operation to evacuate the uterus refused because of religious convictions.

Apparent, though only temporary, improvement following administration of magnesium sulphate solution.

Autopsy findings by a skilled pathologist.

This opportunity is taken to thank Sister Moquin and Dr. Dwyer for their untiring efforts in this case.

A CASE OF RAT-BITE FEVER

By R. CAMERON STEWART, B.Sc. (ARTS), M.D.,

Associate in Pædiatrics, Royal Victoria Hospital, Montreal

Rat-bite fever, as the name implies, is a generalized infection following the bite of a rat. The condition presents a picture so definite in its outlines, and responds so promptly and favourably to the proper therapeutic measures, that it is undoubtedly a clinical entity due to a particular infective agent. The disease is so distinctive in its later stages that it can then be easily differentiated from an ordinary septicæmia, the latter, which might result from a rat-bite as readily as from any other kind of bite, and may cause some diagnostic difficulties during the first few days of fever.

Rat-bite fever, also known as *Sodoku*, appears

to be more common in the Orient, and much of the best work on the subject has been done by Japanese investigators. The disease was first described in detail by Miyake in 1900. Treatment with Salvarsan was introduced by Hata about 1912. This type of arsenical therapy has proved so uniformly successful that it still remains the one of choice.

The disease has several major characteristics, among which are:

1. The preliminary bite of a rat or of some animal, as a cat or a ferret, which has been in contact with rats.

2. An incubation period of ten to thirty days or more, usually about two weeks.

3. A temperature curve which runs a typical course. It is suggestive of malaria or relapsing fever; the paroxysms recurring at regular intervals of several days, the temperature rising gradually to a maximum on the second or third day and falling by crisis, often accompanied by sweating. During these periods of fever there may be headache, muscular pains, dysphagia, thirst, nausea and vomiting. The leucocyte count rises, reaching 15,000 or more.

4. Skin reactions, of several forms;

- (a) Reaction at the site of injury—redness, tenderness, and swelling, in other words, an erythema. The outlines are well defined, the edges slightly raised and of somewhat deeper colour; there is no tendency to abscess formation.
- (b) A similar reaction over the proximal lymph-nodes, which may become palpable.
- (c) An erythema about the neighbouring joint, when the bite is on an extremity.
- (d) A general macular eruption over the body and extremities, consisting of circular reddish spots, from one to three or more centimetres in diameter, slightly elevated, with sharply defined edges. These spots tend to disappear on pressure and do not itch or desquamate. After one or two of the paroxysms of fever the spots may become somewhat ring-shaped, resembling the lesions of erythema multiforme.

During the remissions of temperature the local erythemas and macular spots fade but do not disappear.

5. Rapid response to treatment with Salvarsan or similar arsenical preparation. One injection usually effects a cure.

If untreated, the duration of the disease is indefinite. The mortality is said to be about 10 per cent.

The marked periodicity, so similar to that exhibited by relapsing fever, the prompt response to arsenical treatment, and the positive Wassermann reaction that can sometimes be demonstrated, all suggest that the condition is one of spirochætal infection. These organisms have been found in the blood in so many human cases that they are accepted as being the causative agents. The particular variety involved is called *Spirochæta morsu muris*. It would seem that rats and similar animals are somewhat prone to infection with spirochætes and often harbour these organisms without obvious signs of disease.

The following are details of a case which last year came under observation.

An infant of seven months, previously healthy and with irrelevant personal and family history, had the left cheek bitten and the upper eyelid scratched, presumably by a rat. Some redness and swelling followed and the baby was taken to the Out-Patient Department of a hospital, where hot boracic fomentations were advised. The condition improved within the next few days and the child appeared practically well. Thirteen days after the injury the lid again became swollen and red. Three days later the patient was admitted to the Royal Victoria Hospital. There was persistent fever and the swelling of the lid caused the eye to become closed. The swollen lid was later incised, but no pus was obtained.

Twenty-five days after the initial bite a macular eruption was noticed. The temperature became definitely relapsing in type, the skin

lesions brightening and fading with its rise and fall. These lesions were of the typical character already described: a circular area of erythema, with well defined edges, surrounding the inflamed and swollen eyelid; another area in front of the left ear, over the lymph node; macules, about twenty-five in number, distributed over the face, trunk, and extremities. During the periods of fever the child cried a little and appeared to dislike being handled, probably an indication of malaise. The general condition remained good in spite of the high temperatures registered during the exacerbations; there seemed to be no acute pain, and nourishment was well taken.

There was a moderate leucocytosis, counts varying from 10,200 to 18,600. The urine was negative. Old tuberculin 1/10 mgm. intradermally gave a negative reaction.

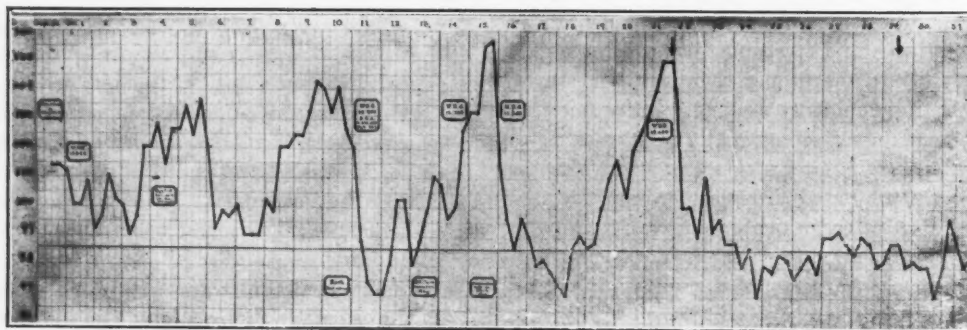
The Wassermann test on the blood was negative.

Several attempts to demonstrate the spirochæte were unsuccessful.

As there seemed little doubt in regard to the diagnosis, and it was deemed inadvisable to delay treatment too long, sulpharsphenamine was given on the thirty-sixth day after the injury, with rather dramatic results. The injection (indicated on the chart by the first arrow) was made at the height of an exacerbation, 70 mgm. being given intramuscularly. The weight of the baby was 7 kilos (16 lbs.).

The temperature thereafter remained practically normal, the skin reactions rapidly disappeared, and the eye opened with the subsidence of the swelling of the lid. As a precautionary measure a second dose of sulpharsphenamine (105 mgm.) was given eight days

CHART I



Rat-bite fever showing course of temperature before and after treatment.

after the first (second arrow). The child was discharged from hospital a week later, apparently well. There has been no return of any symptoms suggestive of the condition.

This case, from the records of the Department of Medicine, Royal Victoria Hospital, is presented as one of comparative rarity on this continent, though sporadic instances of the disease are reported from time to time. The infection has been used, like malaria, to some extent in the treatment of neuro-syphilis.

Acknowledgement and thanks are due to the Departments of Ophthalmology and Bacteriology of the hospital for their co-operation, and to Dr. H. B. Cushing, Professor of Paediatrics, McGill University, and Physician to the Royal Victoria Hospital, for invaluable aid.

A CASE OF EARLY PREMATURE LABOUR WITH SURVIVAL OF THE BABY

BY WILLIAM J. STEVENS, M.D., C.M.

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Ottawa

The survival of premature infants under the usual period of viability is sufficiently rare as to warrant reporting this case.

The mother was a primipara, 27 years of age. Her statements are considered authentic and reliable.

The patient had had four months' antenatal care. Her history was irrelevant, except that her menses had always been somewhat irregular. She suffered moderately from morning sickness. Her pelvic measurements were normal; also the urine and blood pressure.

On the night of March 31, 1928, the patient went into labour without any apparent cause and was taken to hospital. She was given rectal synergistic analgesia with good success and was delivered normally at 8.25 p.m. of a female baby weighing 3 lbs. and measuring 36 centimetres long. Wassermann tests were negative. The baby appeared to be quite premature and weak. Everything was done to save the child, and its survival, on account of the duration of the pregnancy, becomes the chief point of interest.

The patient's last period was August 1, 1927; she was married on September 7, 1927; her delivery occurred on March 31, 1928, making the birth approximately 204 days after marriage, or about 6½ months.

After delivery, the baby was oiled, rolled in a cotton jacket, and treated in a special compartment for premature babies. Its temperature was maintained by means of a hot water bottle, and the room was kept at 85° and the humidity between 50 and 60°. Gauze diapers were used and the baby practically left unhandled. The baby was given 5 per cent lactose solution, one drachm every two hours with a medicine dropper. On April 2, the mother's breast milk, diluted with equal parts of 5 per cent lactose, was given (four drachms by gavage every three hours). The evident need of fluids was shown, and on the fourth day the baby received 30 c.c. of normal saline intraperitoneally. Further intraperitoneal injections were given on the 5th, 7th, 8th, 10th, 12th, 15th, 17th, 19th, 20th, 21st, 22nd and 23rd of April. On April 16th the baby was put on a formula by gavage of butter soup, breast milk not being available. Later on lactic acid milk was used; then protein milk with cod liver oil by gavage and later by Brecht's method. The temperature varied from 98° on March 31st to 99.4°, with the exception of 103.4° on April 17th, when daily intraperitoneal feedings seemed to substantiate the apparent lack of fluids. The weight of baby, 3 lbs. at birth on March 31st, fluctuated between 2 lbs. 10 ozs. on April 2nd, 2.8 on April 12th, 2.10 on April 15th, 2.12 on May 1st, 2.15 on May 10th, 3 lbs. 3 ozs. on May 12th, 3.9 on May 25th, 3.11 on May 30th, 3.15 on June 7th, 4.2 on June 14th, and 4 lbs. 6 ozs. on June 21st, the date of baby's leaving the hospital on the mother's insistence, the eighty-second day of its age.

Since discharge from the hospital the baby has received good average maternal care at home, and the protein milk formula has been continued. On September 14, 1928, the baby weighed 8 lbs. 14 ozs.; on September 21, 1928, its weight was 9 lbs. 1 oz. and it is doing very well.

We have had no other case as premature as this one in which success has attended the raising of the baby.

Retrospect

THE PRESENT STATUS OF THE TREATMENT OF VARICOSE VEINS BY INJECTION

By L. H. McKim, M.D.

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Although the pioneer work on which this method of treatment is based dates back to 1851, when Pravaz injected ferric chloride in the treatment of aneurysm, very little was heard of it, the procedure being regarded by the majority of surgeons as a much too dangerous method, on account of the possibility of embolism. During the past two years, however, many different workers having reported successful results, it is felt that a brief review of the general consensus of opinion at the present time may be of interest.

Gay, in his book on Varicose Disease, published in 1868, mentions the application of the ferric chloride injection treatment of Pravaz to the treatment of varicose veins, and refers to its use in England, France, and Germany at that time. The bulk of the credit for the development of the method in recent years seems to be due to French workers. Tavel, in 1904, was apparently one of the first to use the method. More recently, Sicard and Gaugier¹, Genevri², Forestier³, Delater⁴, and Troisier⁵, may be mentioned as important contributors to the subject. Linser⁶, in Germany in 1912 and also in 1925, reported work along the same line.

Recent articles by three workers may be taken as summarizing the general trend of English, French, and American opinion at the present time. The authors of these are Douthwaite⁷, Forestier³, and McPheeters⁸.

Douthwaite's work is based on a series of more than one thousand injections since his first published work in 1926. He has given more than two thousand injections, using neutral hydrochloride of quinine,* and a smaller number, using sodium salicylate and also glucose. He uses only 1 c.c. at the first injection. If no idiosyncrasy for quinine is present he uses a considerably larger quantity on the next occasion. Injections are given at intervals of about one week. He occasionally uses perivenous injections in severe cases. He claims that intravenous injections are usually painless and that recurrences do not take place.

He also states that sodium salicylate is more painful, and more liable to cause sloughing, if any of the solution escapes into the tissues. He quotes Meisen of Copenhagen as reporting several cases of ascending phlebitis when using this substance. He has not personally used

biniodide of mercury. He has used glucose but has not had satisfactory results with it. Phenol and iodine solutions are not recommended by him.

Douthwaite claims that the obliteration is due to the irritation of the endothelium of the veins, producing an instantaneous phlebitis, limited in extent, and followed by the deposition of fibrin, and later organization. He claims that no accidents are recorded as following the quinine-urethane solution. He gives the following definite contraindications as to the use of sclerosing injections: (1) pregnancy, particularly in using quinine; (2) old-standing or recent phlebitis in deeper veins; (3) diseases of the heart, with signs of imperfect compensation.

Forestier reports more than four thousand injections. He has used mainly three solutions: (a) sodium salicylate in 20, 30 and 40 per cent strength; (b) red mercuric iodide; (c) quinine hydrochloride and urethane.

He claims that no fatal cases of pulmonary embolism have followed the use of any of these solutions, but states that two fatal cases have been reported following the use of concentrated solutions of sodium chloride or glucose. He admits the occasional occurrence of colitis with diarrhoea and hæmorrhage after the use of mercuric iodide. He has never had a case of sloughing following the use of sodium salicylate. He emphasizes, however, the importance of not allowing any solution to escape into the tissues. He mentions the following as contraindications: (1) old persons with enfeebled health; (2) extensive œdema of the lower limbs; (3) recent attacks of varicose phlebitis, as he thinks there is a liability to rekindle the infective process in the latter; (4) varices accompanying pregnancy, which, he thinks, are due not to pelvic pressure but to endocrine disturbance; (5) collateral varices at the junction of the limbs and trunk, where the flow is proximal rather than distal, as in the ordinary varicose vein.

McPheeters' work is based on a series of 180 injections in 31 cases. He claims that 20 per cent sodium chloride is superior to all other solutions. The use of novocaine solution to prevent pain is dangerous on account of the danger of shock when administered by the intravenous route. He condemns the use of mercuric iodide as dangerous. Glucose is objected to on the ground of its viscosity, necessitating the use of too large a needle, with increased danger of leakage into the tissues through the point of entry into the vein.

The efficiency of sodium salicylate he considers as great as that of any other solution. The sloughing reported following its use he considers as due to improper technique in injecting, and its toxic effects as due to idiosyncrasy of the patient,

* Quinine Hydrochloride (B.P.)	4.0 grm.
Urethane	2.0 grm.
Aq. Dest.	30 c.c.

which can be guarded against by proper testing out, as with quinine.

Various other solutions are referred to briefly. The technique of injection is strongly emphasized, the chief points being the necessity of being certain that the vein has been entered before injection, and the prevention of leakage from the vein into the tissues after withdrawal of the needle. Two fatal cases are reported, one from fat embolism and the second from mercurial poisoning. Apparently these are not the same cases that are referred to by Forestier.

In a later paper McPheeters⁹ claims that the injection treatment can be started at once in badly infected ulcers. He reports the use of salt solution for extensive cases, also of calrose, sodium salicylate, and mercuric iodide in resistant cases.

In a still more recent paper, McPheeters and Rice¹⁰ have collected a series of cases illustrative of various untoward results. They report having found only seven deaths which can be attributed to the injection method, as having occurred in about 53,000 cases. Of these, four were from pulmonary embolism. Sodium chloride was used in two of these cases, in one of which invert sugar was used in the other leg at the same time. Pregl's solution was used in one case, and the solution employed in the fourth is not mentioned, nor is the date of death, which in the first three cases occurred on the 10th, 14th and 23rd days.

Of the other three fatal cases, one died from "septic thrombo-phlebitis." Another died on the 29th day from septicæmia, after the excision of a piece of gangrenous skin on the 7th day, with subsequent infection. While this death is definitely attributed to septicæmia the patient had complained of pain in the chest. No autopsy could be obtained. The third case died on the 12th day from mercurial poisoning; he had received two separate injections of 1 c.c. of 1 per cent mercuric iodide.

Three other deaths from pulmonary embolism are reported, although the evidence is not so conclusive as in the four mentioned above. One of these was treated with glucose. Six weeks later he was operated on for hæmorrhoids with an infected anal fissure. He died on the 5th day after operation. The second case died one month after the injection of sodium chloride. He had thrombosed hæmorrhoids and the embolus was attributed to these. The third case died one month after treatment with glucose. Sloughing of a superficial knot of veins occurred. These were excised, and the patient died ten days later from pulmonary embolism. One non-fatal case of embolism is reported.

ANALYSIS

An analysis of the cases reviewed by McPheeters and Rice would seem to indicate the following conclusions:

(1) Seven deaths are attributable to the injection treatment.

(2) Three additional deaths following the treatment were probably due to other causes.

(3) Eight cases of pulmonary embolism have occurred after the treatment. Of these: (a) four cases were attributable to the treatment; (b) one was attributable to the treatment but was not fatal; (c) three cases were fatal, but were probably not caused by the injection treatment itself.

(4) There were two cases of infection which proved fatal, one with septic thrombo-phlebitis, and one from septicæmia.

(5) One died from mercurial poisoning.

These authors think that solutions for injection may be arranged in their order of effectiveness as follows: (1) mercuric chloride; (2) sodium chloride; (3) sodium salicylate; (4) invert sugar solution; (5) metaphen.

Their choice for every-day use is, however, in the following order; sodium chloride, invert sugar; sodium salicylate; mercury; metaphen.

They consider that injury and stimulation of the vein wall is the object of injection, and that solutions which are coagulants of the blood should not be used. They believe that all extensions of the thrombotic or sclerosing process which occur following injections are due to secondary infective phlebitis, and that the presence of a phlebitis is an absolute contraindication for injection. They emphasize the importance of a careful technique and a knowledge of possible complications.

TECHNIQUE

T. H. Treves Barber¹¹ gives the technique in detail. He emphasizes the following points: (1) Begin at the lowest point; (2) Use small, sharp needles; (3) Be sure that the needle is in the vein; (4) Inject towards the trunk; (5) Have the patient lying down as soon as it is certain that the vein is entered; (6) Stop the injection immediately if any stinging or burning pain occurs, or if there is any swelling over the vein; (7) Apply pressure over the puncture in the vein to prevent leakage.

Barber uses 15 per cent sodium chloride exclusively. He injects 5 c.c. of sterile water if he suspects any leakage of the salt solution into the tissues.

CONCLUSIONS

1. The treatment of varicose veins by injection must now be regarded as a surgical procedure worthy of consideration in cases presenting no contraindications.

2. Treatment by this method does not as a rule necessitate hospitalization.

3. Treatment by this method, while sometimes uncomfortable, is not as a rule unusually painful, when careful technique is observed and proper solutions are used.

4. Immediately painful results, as well as later sloughing of the skin and constitutional disturbances, are probably most often due to: (a) faulty technique; (b) use of too large an amount of solution; (c) improper choice of

solution; (d) idiosyncrasy of the patient to the solution used.

5. Seven deaths, including four cases of pulmonary embolism, are reported in approximately 53,000 cases.

6. Recent phlebitis is an absolute contra-indication.

7. Excision of a gangrenous slough should not be considered lightly, and if the slough is infected it is an absolute contra-indication.

8. Absolutely no operative interference with an infected ulcer is permissible during the treatment.

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Association Notes

Re COLLECTION OF THE ANNUAL FEE

The following letter is being sent to all our members and calls for special attention:

Dear Doctor,

During the past several years, the Association has received many suggestions from members living in various parts of Canada that our annual fee for the ensuing year be collected in the autumn rather than in the month of January.

There are so many financial obligations falling due at the beginning of the New Year that medical collections in many parts of Canada are poorest at that time; and, conversely, money is more plentiful in the autumn and collections easier. Particularly is this said to be so in Western Canada. Moreover the early collection of the fee will eliminate the financial loss which is incurred in supplying *Journals* for a period of several months to members whose fees are in arrears.

After very careful consideration at our last annual meeting, Council decided that the fee for the next calendar year should be collected during the months of October, November and December.

We hope that all members of the Association will heartily concur in the change, and that the fee notices, when issued, will receive prompt attention.

Yours faithfully,

(Signed) T. C. ROUTLEY,

General Secretary.

Editorial

SLEEP

SLEEP, "the twin brother of death," is a natural phenomenon familiar to all. It is taken for granted, and, for that reason, probably arouses a very languid interest among the generality of people. Its opposite, insomnia, does have the effect of stimulating enquiry, however, and persons afflicted with this distressing trouble frequently consult the medical man, who, unfortunately, in regard to the physiological and pathological problems involved, is apt to be as ignorant as they are. For, strange as it may seem, the physiological state that we call sleep constitutes a problem by no means fully solved. The reason for this is that the subject has not attracted the attention it deserves; no great amount of experimental investigation has been carried out; what exists has been published at rather wide intervals, and has been inconclusive, not to say contradictory. The earlier work, that of Manaccine¹ and Tarchanov² was done on puppies, and was followed by that of Sidis³ and Kleitmann⁴ with Lee⁵. Pieron⁶ and Pavloff used dogs. Bast, Loevenhart *et al.*⁷ employed rabbits. The use of animals of different species and ages and of different methods to maintain the state of wakefulness makes it difficult to compare and accurately appraise the results.

The sleeping state is characterized by a number of familiar features which need only be mentioned to be admitted. The chief of these is the abolition of consciousness, and in this sleep resembles some other important conditions, such as, stupor, coma, catatonia and catalepsy, and syncope. Stupor and coma are conditions in which the patient can be brought back to consciousness partially and with difficulty, or not at all; waking from sleep is rapid and complete. In contradistinction to catatonia and catalepsy the muscles during sleep are in a flaccid state and the body responds quickly to stimuli. Syncope may be differentiated by its suddenness of onset, its fleeting nature, and the special circulatory phenomena.

But, besides the loss of consciousness in sleep, we have to note other features, the regular breathing, the quiet steady pulse, and the profound muscular relaxation. Under normal conditions a person goes to sleep fairly quickly, wakes up promptly after a sufficiency of rest, and during the sleeping period exhibits varying grades of response to external stimuli, depending on the character and intensity of those stimuli and the depth of the unconsciousness. At the same time certain of the bodily functions may be carried on, but on a lower plane of activity.

As all know, there are certain conditions that conduce to natural sleep, such as an accustomed hour, darkness, a well-ventilated room, a good bed, and *quietness*. Over-tiredness, mental activity, worry, an unsuitable posture, are all inhibitory. Sleep exemplifies very well the great law of periodicity as well as the law of habit. We go to bed at a certain hour every night, under favourable conditions, and with the definite intention of going to sleep. The oftener the attempt is made, the easier is the end accomplished, so that in time a habit and a periodicity are established. Under the most favourable conditions sleep becomes automatic and inevitable.

Sleep has been interpreted in various ways. Rather fancifully, it has been held to connote a wish to return to the mother's womb, because the curled-up position of the normal sleeper resembles the fetal attitude. Actually, the flexion of the joints and the relaxation of the muscles are assumed because the position is the most restful, the least aggressive, so to speak, and may be seen in melancholics as well as sleepers. It is, appropriately, a negative rather than a positive thing, passive rather than active.

Sleep has been called a "death-wish." This view will not apply to the majority of people, it is certain.

It is an instinct, like the instinct that leads birds in the autumn to leave for warmer

climes. As such, it can hardly be explained, unless on the basis of anticipation.

It is a conditioned reflex; this on the authority of the great physiologist Pavloff. Some words of explanation are required here.

If food is shown to a hungry dog, immediately there is an outpouring of saliva. This is a direct, or unconditioned, reflex. But, if at the same time that the animal is fed a bell of a certain note is sounded the same result is obtained. If this is repeated until an association of ideas is formed saliva will be secreted by the dog every time that particular bell is rung, even if food is not presented. This is the conditioned reflex. Pavloff found (1910-12) that, in the course of his investigations, it was difficult to keep the animals awake. If the period between the action of the conditioning reflex and the giving of food was lengthened, the dog, concentrating his attention on the next event, would go to sleep, even if very hungry. Furthermore, the constant recurrence of the conditioning stimulus, without food, would provoke sleep. Pavloff assumes that the focussing of an excitation, in the case of natural sleep coming from the skin, on one area (motor) of the cerebral cortex causes inhibition of other areas. Sleep, then, differs from other conditioned reflexes only in that there is a more extensive inhibition, affecting the whole cerebral cortex and even the sub-cortical centres. There are, however, some observations that seem to indicate that this is not a sufficient explanation. The development of conditioned reflexes requires the integrity of the cortex. Yet, in decorticated animals more or less typical rhythmic sleep will occur. The mechanism of sleep, then, is not entirely cortical, and does not depend altogether on generalized cortical inhibition.

It is an auto-intoxication. There is some experimental evidence in favour of this view. For example, if an animal be kept awake for a prolonged period its blood or cerebrospinal fluid, if injected into a second rested animal, will produce drowsiness in the recipient, even if muscular fatigue and exhaustion are not operative in the donor. The state of wakefulness, then, seems to lead to the formation of a toxin, which is different from the toxin of fatigue. What this toxin is is not known. Examinations of the blood

during sleep have not revealed anything that seems of moment, except, possibly, that the concentration of calcium and potassium is lowered. Much more evidence will have to be presented before this view can be accepted.

Sufficient has been said to show that the problem of sleep is by no means a simple one. Experimental investigation of the subject is fraught with special difficulties. The only way to keep the experimental animals awake is by some form of muscular exercise. Kleitman⁸, one of the most recent workers, emphasizes that it is impossible to divorce experimental insomnia from muscular activity, and, for this reason, admits that his own results are of doubtful value. And so are most of the other researches.

One of the most plausible and widely accepted theories is that sleep is due to anæmia of the cerebral cortex. One of the points in favour of this view is that we frequently become sleepy after a heavy meal (derivation of the blood to the alimentary tract) and that it is difficult for most people to sleep with the head low. There is also the analogy between the unconsciousness of syncope and that of sleep. Tarchanov (*loc. cit.*) found that the position of the head relative to the body was an important factor in inducing or preventing sleep in puppies. Some puppies fell asleep more easily when the head was elevated above the general level of the body. When the head was down it was impossible to make the animals fall asleep. He also exposed the brain in his animals and noticed its condition both in the waking state and during sleep. During sleep the brain became and remained pale and the superficial blood vessels were contracted; the reverse obtained during the waking period. Repeating this experiment, Kleitman was unable to confirm it. Nor did he find that the position of the body was of any special importance. The theory of cerebral anæmia has, therefore, not yet been established.

It is quite possible for insomnia, prolonged in experimental animals for four or five days, to cause death, as several of the investigators have shown. The usual effects of experimental insomnia are, loss of appetite, with consequent reduction in weight, muscular weakness, a decrease in the number

of the red blood corpuscles, sometimes a fall in the temperature of 4° to 5°C. towards the end, and death in convulsions. In the fatal cases Manaceine, followed by Pieron, and by Bast, Loevenhart and their associates, have described definite changes in the cells of the central nervous system, but such were not observed by Kleitman, nor do those mentioned quite agree as to the distribution of these lesions. It is notoriously difficult, for reasons connected with technique, to be certain that structural changes that may be noted in the cells of the central nervous system are actual and of import and not merely artefacts. If the changes described are really degenerative this would point to a toxic element in insomnia.

One phenomenon seems to be quite definite, and that is, that during sleep the muscles become markedly relaxed, returning to tonus so soon as the animal awakes. Kleitman's experiments in putting puppies to sleep confirm those of Sidis. The latter found that there was a tendency for the animals to fall asleep when they were placed under conditions in which they could relax their musculature. Sidis emphasized also monotony and limitation of movement, but it is possible that these factors are only contributory, in that they tend to promote greater muscular relaxation. Kleitman concludes from the evidence available "that sleep comes from a decrease in the number of afferent impulses reaching the central nervous system from the sensorium, and that muscular relaxation, decreasing considerably the

number of proprioceptive impulses, constitutes the last stage of the process by which sleep is precipitated."

This, perhaps, does not get us much farther, except that surplus connotations are eliminated. It seems clear that sleep is a necessary factor in the maintenance of life, but it is also an interesting speculation to enquire how it originally came about. Perhaps primitive man, tired with the chase or warfare, sat down to rest. For security's sake he would choose a retired spot or a dark cave. The approach of night, quietness, and muscular relaxation, all contributed to the feeling of comfort. The toxin of fatigue would produce a numbing of the sensibilities, and a loss of consciousness. The oftener this was done, the easier would be the inducement of sleep, until the process became automatic and periodical. Eventually, the toxic element, in many instances at least, would pass into the background, and the element of suggestion would become more prominent. May it not be that sleep is, in the main, a matter of auto-suggestion?

A.G.N.

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NOISE

MUCH has been written of late on the evil of noise, both in medical journals and in the public press. While all are not clear as to the proper remedy, there is complete unanimity on one point, at least, that a great deal of the noise with which our cities are cursed is unnecessary. There is much patient endurance of ills in this world, but when influential newspapers take up the cry we may conclude with some reason that at last the worm has turned, or is about to turn.

Noise seems to be an inseparable adjunct of our modern existence. It is clamant,

inevitable, and, for the majority of people, inescapable. In some sense it is a measure of our progress in civilization; it is also to some extent an indication of thoughtlessness or callousness. If one stands on the summit of Mount Royal, overlooking the city of Montreal, he is conscious of a steady rumble, like the muffled roar of a mighty sea. The quality of this noise will vary somewhat at different times of the day, but most of it is due to automobiles, lorries, tram-cars, trains, and other wheeled vehicles. There is an occasional flavour of bells, whistles, and sirens. The latest enormity is the gramo-

phone which belches its cacophony over the sidewalk. Fortunately its range is more limited. Bells, on account of their ancient and hallowed associations, are probably not distasteful to many people. We have the poet's authority that they are musical, and music, according to Samuel Johnson, is "the most bearable of all noises." The most insistent noises are those associated with tram-cars and motor vehicles, as most persistent. "Flat wheels," squeaky brakes, and squawky horns provoke many a shudder.

We may properly enquire how far noise is inimical to health. That it is so, under certain circumstances, is tacitly admitted when we put up signs on our streets—"Hospital Zone. Quiet Please." Incidentally, it may be remarked in passing that the modern hospital, with its steel and concrete construction, is not the quietest place in the world. It is really a vast resonance chamber. Metal doors groan and bang; footfalls and voices re-echo along the corridors; telephones are continually ringing; and conversation can be heard through the partition walls. This should not be. Certainly, noise interferes with sleep, far more than we are apt to realize, and lack of sleep is injurious. In this jazz age, with its high pressure performances both at work and play, its scandalous hours, and dietetic extravagances there can be little doubt that the nervous system is being maltreated. Add to this the influence of continual noise and in time "frayed nerves" will become general. It will be interesting to see what the effect of all this will be in the future on the production of psychoses and insanity. It is fortunate that there is a counterpoise to the insult of noise. When a stimulus is continuous or frequently repeated the recipient nervous mechanism becomes callous; it does not "register." This may be illustrated by the common experience with the clock. So long as a clock is going we do not hear it, but, if it stops we immediately become conscious of the fact. We have here a protective mechanism. Still, it may be doubted whether this protection is adequate. Influences that we are unaware of may yet be harmful, given sufficient time for their operation. Continual dropping wears away a stone. While it is difficult to advance concrete proofs on the matter there is little doubt in

the minds of medical men that the constant concentrated noise of our big cities is harmful. Authorities on nervous diseases have expressed themselves in this sense, notably, Sir Robert Armstrong-Jones.

What can be done about it? The measures, to be adopted will, naturally, vary in different places, according to local conditions. In Great Britain the profession through its great organ, the British Medical Association, has taken the first steps to bring about an improvement in the state of affairs. At the Annual Representative Meeting of the Association held at Cardiff a resolution was adopted calling for measures to be taken for the suppression of unnecessary noise in the interests of public health. The Medico-Political Committee, at a recent meeting, decided to take prompt action in pursuance of the resolution referred to. The Ministry of Health has been asked to receive a deputation and local branches of the Association will be urged to approach their local authorities both to make use of existing powers to deal with the nuisance and, when necessary, to apply for new ones. A conference has already been held at the Home Office between the Secretary of State, the Minister of Transport, and the heads of both departments. One of their conclusions is that "the increase in the volume of noise is largely due to the increase of motors, and of the uses to which motors are put, and to the abuse of various types of horns." It has been decided to draft regulations directed to abating the nuisance of motor traffic noise. Paris, which a few years ago, in certain thoroughfares, with its ramshackle cars, its cobble stones, and the incessant tooting of horns, was little short of an inferno, has taken recently a great step in advance. Motor horns may not now be used there between certain hours of the night. Other places might well follow their example. It is to be remembered, also, that noise is only one part of the question. Vibration, which is chiefly caused by trams and heavy drays, also enters into it.

When all is said, it would seem that the most important single factor is *speed*. Excessive speed increases the grind of the machinery, and the amount of vibration, necessitates the more frequent application of the brakes, and leads to greater blowing

of the horn. And, it is just this factor of speed that is notoriously the most difficult to control. To effect the necessary reforms

will require the active interference and co-operation of automobile associations and municipalities.

A.G.N.

PROGRESS IN MEDICINE

WE not only pride ourselves upon living in the most progressive period of the world's history, but sometimes are inclined to be boastful of this our good fortune.

Few will take exception to the claim that science in general, and medicine in particular, has made as much progress during the last fifty years as during the whole previous history of mankind. Some of our more enthusiastic members claim that the major part of medical progress has been made within the last quarter of a century. It may be that even the latter assertion is within the range of fact.

We are perhaps too much inclined to forget that active advance in medicine did not begin until within comparatively recent years. We, of course, do not imply that great credit is not due to Hippocrates and others of the old Greeks who untrammelled medicine from the traditions and superstitions of the pagan priesthood, and who made it clear that there are no supernatural causes of disease. Even after giving due credit to the old masters and to such schools as those at Alexandria and Salernum, and to the part played by Arabian physicians in the preservation of Greek teaching and the addition of a few new drugs, we are compelled to admit that medicine remained in a practically stagnant condition until Vesalius gave to the world the important facts about the anatomy of the human body. It may help our orientation by remembering that this demonstration did not take place until some time after the discovery of America, which is not a remote date in history. Nevertheless, except for the contemporaneous brilliancy of Paré in surgery, and the unique eccentricities of Paracelsus in general medicine, we can attribute little progress even to this period. Enterprising Europeans had been exchanging glass beads or equally valueless trinkets for the valuable silver and gold ornaments of the original inhabitants of this Western hemisphere for nearly half a century before Vesalius began to attract

medical students to his classes at Padua, and Linaere, perhaps the greatest of medical humanists, to herald the revival of learning in England. The stimulus of Vesalius, great though it was, was not sufficient to create that spirit of investigation which alone could establish medicine on a firm foundation. Not until Harvey set forth his views on the circulation and supported them with his well-considered experiments did medicine really enter upon the path that led to progress. The discovery of the circulation was the most momentous event in the history of medicine. Harvey's methods at once excited the admiration of many, and with his work we may say the experimental method in medicine really began. This was in the year 1628.

Harvey and Malpighi proved the circulation to be a physical process, but threw no light upon the chemical processes, which even then were considered to be of very great importance. It was really not until the eighteenth century was well advanced that scientists acquired definite knowledge about oxygen, nitrogen, and carbon dioxide, and that the understanding of respiration became possible.

These discoveries in chemistry were made during the "Hunterian period," and this year marks the bicentenary of John Hunter's birth. Hunter's contributions to medicine are very generally known, and we speak of him still as one of the three greatest surgeons of all time. It is difficult, however, for us to realize that it is only a century and a half since John Hunter was recognized as a man of unusual qualities. During the span of his lifetime, nevertheless, many most notable advances were made in medicine and the allied sciences. The list of his prominent contemporaries in various fields of activity is a long one. Sir Isaac Newton died only in the year preceding John Hunter's birth. Linnæus and Boerhaave died when he was but a lad. During the active years of his life, Albrecht von Haller, Stephen Hales,

Luigi Galvani, Giovanni Morgagni and Huxham investigated the problems of physiology; Lavoisier and Priestley developed our knowledge of chemistry; and Lettsom, Smellie, Mead, Cullen, Haygarth, Cheselden and Jenner were advancing our knowledge of clinical medicine.

When we realize that these notable physicians and investigators lived within such a

short period of our own era we are impressed with the fact that little advance was made in medicine during the previous ages, and that comparisons of the headway made during the past few decades can be made only with that of the past two centuries rather than with that of earlier times.

W. H. HATTIE

Editorial Comments

THE STERILIZATION OF MENTAL DEFECTIVES

At the last annual meeting of the American Medical Association an interesting commentary on the present position of sterilization in the United States was given by means of a special exhibit consisting largely of a series of maps and graphs. One of these was a map of the United States showing what legislation existed in each state. Considerable variation was evident. In some states there had been no legislative action; in others action had been taken and had then been found to be unconstitutional, while others still awaited the results of legal tests; in some the law seemed to be functioning satisfactorily; in some operative sterilization was made compulsory; in others it was voluntary. Two charts tabulated the states, showing the order in which the first sterilization statute was passed, what classes of individuals were subject to sterilization, and the agencies which had the authority to make the decision to sterilize.

One graph was devoted to the increase in population of institutions for mentally diseased since 1850, and of the mentally defective since 1904. An attempt was made in another chart to summarize the effect of sterilization of the insane and feeble-minded on race betterment, on the morality of the neighbourhood, and on the individual himself. Other maps showed the number and cost per capita of patients in hospitals for mental disease and mental defectives, and the institutions in California in which the insane or feeble-minded were sterilized. Finally, there was a list of the operations which induce sterilization, with or without unsexing.

The data for this exhibit were taken chiefly from a book entitled "Eugenical Sterilization, 1926," by Dr. H. H. Laughlin, but also included information gathered from reports of the United States Census.

The surgical aspect of the subject has been dealt with by Dr. Dickinson in a paper entitled "The surgery of the insane and feeble-minded in California." In this he commented on the necessity of emphasizing the fact that steriliza-

tion did not involve the removal of any organ or the lessening of sex feeling, and referred to the amount of theorizing on the subject which had appeared in the press, in comparison with the collection of facts on the subject. He closed his paper with proposing a resolution that the Section of Obstetrics, Gynecology and Abdominal Surgery recommend to the American Medical Association that it organize or take part in an impartial and thorough investigation of sterilization from the point of view of medicine, surgery and preventive medicine.

The comment made on the subject by the Board of Trustees of the American Medical Association is worthy of note.* They recognize that the interest in legislation for sterilization is widespread, but the medical profession has not given the subject the study it deserves. "If legislation authorizing the asexualization of certain classes in the community does not accomplish the results that its proponents promise, the medical profession may have to assume its share of the responsibility, even though it has done nothing but stand idly by while the legislatures have acted. It seems timely to undertake a study of the field of eugenic sterilization asexualization now, so that the policy of the Association may be wisely determined."

H.E.M.

THE USE OF EPHEDRINE

Ephedrine is an alkaloid whose value in controlling attacks of hay fever or asthma is now fairly well established. It is not a specific remedy for these conditions any more than the very numerous therapeutic measures which in their turn have given relief. It does however most nearly approach that remedy which of all others generally used has the most rapid and beneficial effect, although short in duration, that is, epinephrin hydrochloride given hypodermically. But ephedrine possesses the not inconsiderable advantage of being effective when given by mouth, and when it does give

* *J. Am. M. Ass.*, 1928, **xc**, 1462.

relief it does so for a longer period of time. Ephedrine therefore commends itself rather highly in the relief of asthma.

There are contra-indications to its use, however, which should be carefully pointed out. These depend on the fact that its action is chiefly that of stimulating the sympathetic nervous system, thus causing acceleration of the heart action, along with which there is a temporary rise of the blood pressure. Toxic doses will cause a fall in blood pressure and a depressor effect on heart muscle.

The contra-indications to the use of ephedrine will therefore be mainly the presence of cardiac disease or of a high blood pressure, and it is important to insist upon this. A case has been recently reported* of a patient with a history of hay fever who suddenly developed an acute attack of what was diagnosed as asthma. He was given a prescription for ephedrine and within a space of 20 days took a total of 15 grains. He then came under the observation of Drs. Bloedon and Dickens who found him in a condition of cardiac decompensation with a dilated heart, and a right-sided effusion. They attributed this condition to the effects of the ephedrine, and the large quantity taken was probably enough to give rise to serious results. There appear, however, to have been symptoms of cardiac disease beforehand.

The case is instructive in emphasizing the dangers of an indiscriminating use of ephedrine. Asthma is such a common disorder that no care is too great in enforcing caution in the prescribing of drugs which the patients can obtain for themselves. Incidentally it may be remarked that ephedrine is now recognized to have very little value in asthma due to ineffective processes and in so-called "cardiac asthma." H.E.M.

THE RABIES SITUATION

A short account of the situation regarding rabies in Ontario was given in our July number (p. 78) by Dr. W. D. Hay, and reference was also made in the same issue to the review by Drs. Rice and Beatty† of the prevalence of rabies in the United States.

At that time no case of fatal human rabies in the present epidemic had been reported in Ontario, but we have now received details of one such case in the *Public Health Journal* (September, 1928, xix, 421), reported by Dr. F. Adams. This was a little girl, aged four, who on or about the first of June of this year while playing with a cat was scratched and bitten on the left temple. The wound was treated with iodine and no special attention was given to

the incident. About two months later the child developed signs of involvement of the central nervous system and died five days later with well marked symptoms of rabies. The post-mortem examination fully confirmed the diagnosis; the brain showed the microscopic changes typical of rabies and rabbits inoculated with the brain tissue developed the disease.

Dr. Adams points out that the local press had given much publicity to the subject of rabies and had described the transmission of the disease and the precautions it called for. Attention, however, had been focussed largely on the transmission of rabies by dog bites, although a case of a rabid cat had occurred in June in Ontario, and three in Detroit.

The case is worthy of note as emphasizing the difficulty in controlling the spread of rabies, a difficulty which is unusually great in the neighbourhood of the border cities in Ontario. Detroit in particular labours under the disadvantage of exceedingly rapid growth, and its population is of many racial origins; more than fifty per cent have a mother tongue other than English. The incidence of rabies in Detroit, is rapidly increasing: in 1921 there were 30 cases amongst dogs; in 1927 there were 265; and in the first five months of 1928 there were 302. H.E.M.

THE MONTREAL HEALTH SURVEY

A special article summarizing the Report of the Montreal Health Survey appears in this issue. It is noteworthy that all the newspapers of Montreal (French and English) carried the summary prepared for press release the last Saturday in September. As long as prominent laymen, who accept professional guidance, continue to take interest in health work, we may rest assured that progress in this field is certain.

This survey presents to Montreal a three-year program for health services, which is based upon accepted standards of health work as adapted to local needs. The survey, which covers the country's largest metropolitan centre, will be of interest to all Canada. It will also interest all communities, and may prompt them to enquire if such a survey might not be helpful in their own group. One might ask whether or not it would be advisable for the Canadian Medical Association to consider the provision of a technical field health survey staff which would be capable of making such surveys or of acting as consultants in that capacity. The medical profession is vitally interested in any program of health services presented to a community, and it may be that there is opening a field of national service which the organized profession should enter.

A. GRANT FLEMING

* *Arch. Int. Med.*, 1928, xlii, 322.

† *Am. J. Pub. Health*, 1928, xviii, 421.

THE OSLER LIBRARY

In a letter received lately from Dr. W. W. Francis, who has charge of the cataloguing of the Osler Library, we are informed that every effort is being made to have the library packed and sent to Montreal before navigation closes. It is doubtful however, whether the catalogue which has already reached a volume of large dimensions will be through the press and ready for issue much before the end of the year. The annotations number nearly 8,000, and many of them have been written by Sir William Osler himself, and are his own comment on the book or on the writer.

In this catalogue we are informed the following groupings have been made. The FIRST SECTION includes all volumes either by or about the great innovators in science, including medicine in that term. The names in this group were decided upon by Sir William himself, but at the time of his death he was far from having obtained all the books in this section which he was anxious to have. Some sections are almost complete, such as the works of Vesalius, and of Harvey, and works on the introduction of anaesthesia. In other sections he failed, chiefly through his desire to obtain first editions. The SECOND SECTION is an alphabetical catalogue of the scientific works, for the most part medical, of writers who can hardly be regarded as holding the first rank. The THIRD SECTION contains the literary works of physicians and the quasi-medical writings of laymen, such as Burton's *Anatomy of Melancholy*. This section includes a very complete collection of the works of Sir Thomas Browne and the more important writings of Rabelais and of writers of his school of thought. The FOURTH SECTION is of an historical character and comprises works on the history of medical science and brief modern essays in special subjects with an historical character. The FIFTH SECTION contains biographies, many of which were given by Dr. Adami from his collection. The SIXTH SECTION contains works on the bibliography of medicine and science generally.

The SEVENTH deals with incunabula, and contains about one hundred and thirty-five fifteenth century works, not all medical. Many of these are very rare, and every year they are becoming more and more difficult to secure.

The EIGHTH SECTION is a collection of manuscripts; one of them is a Babylonian tablet on medicine dated about 500 B.C. There are also a few mediæval manuscripts, but most of them are of more recent date.

The library contains about 7500 volumes, and the selection of its books was made by Sir William with an eye to their educational value.

The first section especially was brought together with the view of giving to the student a clear idea of the successive steps by which advancement was made in our knowledge.

A NINTH SECTION has been added containing many donations since Sir William Osler's death and includes a list of about 150 Oriental books and manuscripts presented to the library by Dr. Casey Wood. A.D.B.

No. 3 CANADIAN GENERAL HOSPITAL

The announcement is made that about the third week of November there will be published the official history of No. 3 Canadian General Hospital (McGill), covering the work of the unit from the time of its inception under Col. H. S. Birkett in the autumn of 1914 until its return to Canada in July, 1919.

The book which has been edited and compiled by Mr. R. C. Fetherstonhaugh, historian of the 13th Battalion, Royal Highlanders of Canada and of the Royal Montreal Regiment, 14th Battalion, C.E.F., and has been checked by the Historical Section of the General Staff, Ottawa, will contain a foreword from His Royal Highness the Duke of Connaught, and will include twenty-one chapters of text, thirty-five full-page illustrations, and appendices giving the roll of honour, the nominal roll of the original unit, and the nominal roll of the reinforcements.

The story is written so as to include both the military and medical aspects of the Hospital and recounts many details of the work accomplished by the physicians and surgeons under Col. Birkett, the late Col. J. M. Elder, the late Col. John McRae and those who succeeded them. The book will be printed on laid paper in large clear type and will be issued in cloth-bound and de luxe editions selling at \$5.00 and \$10.00 respectively. The editions which are limited in number may be obtained through the distributors—Burtons Limited, 597 St. Catherine St. W., Montreal.

R. C. FETHERSTONHAUGH

THE EDITOR

The friends of Dr. A. D. Blackader, the senior editor of the *Journal*, and they are many throughout the length and breadth of Canada, will regret to hear of his recent serious illness. At the time of writing he was still confined to the house, but we are pleased to be able to announce that he is well on the way to convalescence. All who know him, including his colleagues on the editorial staff, will join in the hope that he will soon be restored to his accustomed health and vigour. A.G.N.

Special Articles

THE EVOLUTION OF CLINICAL MEDICINE AND SURGERY IN RELATION TO THE PRESERVATION OF HEALTH AND LIFE*

BY FRANKLIN H. MARTIN, M.D.

Chicago

After thanking the American College of Surgeons for the honour done him in electing him President, Dr. Martin said that in his address he would attempt to portray the present evolution of the art and science of medicine, and the part that our profession and the public should have in guiding its successful progress.

Those who visualized the American College of Surgeons, organized it, and have been responsible for its administration, realized from its inception that just to organize another surgical association, just one more academic society, was not a reason to warrant its creation. The College, to justify its existence, would have to assume the responsibility of building for broader science, for more worthy practice, for interest in sustaining the traditions of the greatest profession; and by the example of its Fellows and through open discussion, impress upon the public the significance of scientific medicine as the one authority qualified to maintain the health, and insure the wholesome living of all people.

It was a bold announcement—the declaration by the Founders of the College at its inception.

Among the learned professions, medicine has no equal in longevity, in continuity, in ideality, in disinterested service, and in accomplishments. For twenty-five centuries, medicine exhibits a clear history. Its spiritual and moral creed—the Hippocratic Oath—announced at that early beginning, has been and is as fundamental in the guidance of the true physician as the Sermon on the Mount (first uttered five hundred years later) in the guidance of the true Christian. Spiritually, morally, and scientifically, in all civilized countries scientific medicine is outstandingly the recognized authority in the prevention and cure of disease. Like the great religions of the world, it recognizes no geographical bounds, but, unlike the great religions, it has no division of authority.

A recital of the long chain of distinguished men of medicine, with many links centuries long, reveals an unmistakable continuity. To mention them individually, is to count the beads of a great rosary, one by one, each bead a jewel of rare worth and beauty. It is a record of singular interest. Every physician is assumed to have a knowledge of this history, but he should know it accurately; and for protective information, the

cultural education of each person—man, woman, and child—should include facts of medical history.

For centuries the art of medicine was paramount. This art was based on records which represented careful study of diseases, the effect of drugs, and the performance of operations in dire emergencies only. Familiarity with the action of drugs was discovered and developed to an astonishing degree of exactness; and the proficiency with which the experienced practitioner influenced the different shades of diseases would excite the admiration of the skilled practitioner of our present ultra-scientific age. Like a master musician, the physician of yesterday studied and knew his organ, and no note was too subtle for him to reproduce.

The nineteenth century saw the development of the pure sciences. Rapidly these were absorbed by the medical profession, and now more than ever we may say that we practice the science as well as the art of medicine. Long experience in recorded observation is not the only basis of our accomplishments; but as well the mathematical certainties of pure science and its instruments of precision.

First and foremost are the scientific accomplishments that have definitely modified and controlled specific diseases, and incontrovertibly conserved life and health in a revolutionary manner: the work of Pasteur, and its adoption by Lister in the development of antiseptic surgery; the outstanding pursuits of Koch in modifying tuberculosis; the epoch-making researches by Behring, Roux, and Klebs in controlling diphtheria; the indefatigable labours of Ehrlich in furnishing a remedy for the spirochætal diseases; the achievements of Roentgen; of Eberth in well-nigh exterminating typhoid fever; the painstaking accomplishments of Bruce in sleeping sickness; Ross and Laveran in malaria; our own Reed, Finlay, and Gorgas in yellow fever; Banting in diabetes; and the Dicks in scarlet fever. These specific accomplishments have resulted in saving more lives each year than were lost in the Great War.

There are certain other diseases that reap a large death harvest and a much greater disability. Though we have not a specific for each, we have definite proof that they may be modified or cured if discovered early. These include the degenerative diseases, insidiously begun in middle life and exaggerated in old age; notable among them, cancer, with a mortality of 115 in every 1,000 deaths, though if recognized early it may be cured; heart disease, that makes its deadly swath in individuals in the most productive period of life, 185.5 to every 1,000 deaths, may be modified if early recognized and appropriately treated; diseases of the kidneys and blood vessels, with their harvest in middle life of 110 in 1,000 deaths.

* Presidential Address (abridged) delivered before the American College of Surgeons, Boston, October 8, 1928.

Preventive medicine, or the early application of curative measures in these diseases, would save thousands of lives each year.

So to extend longevity to any material degree, we must first discover the cause of, and secure a remedy for, degenerative diseases.

The degenerative diseases cause one-third of our deaths. They are definitely influenced by concurrent incidents, as habits of living, strenuous mental activities, improper diet, excessive use of stimulants, particularly alcohol, lack of proper exercise and recreation, and infectious diseases that thrive on a weakened resistance. They are the result of age or its equivalent—excessive work.

The science of chemistry, endocrinology, biology, physiology, clinical pathology, and basic metabolism, is tackling and solving new problems every day. Adrenalin, thyroxin, insulin, and pituitrin are examples of exact and progressive accomplishments. Undoubtedly the substances that will control the degenerative diseases are now in the making.

Scientists today are mining the materials; men of vision are fitting these materials into practicable theories; and practical men are straining at their leashes ready to utilize these materials and make great visions come true.

PUBLIC HEALTH

We know to a mathematical certainty the contributions of scientific medicine toward public health in comprehensive hygienic regulations and general sanitation. The findings of scientific medicine, through civic and other governmental authority, are applied to purify the water supply, to dispose of sewage, to protect and conserve the purity of food, to ventilate public buildings and places of amusement—gifts which the lay public has accepted almost unanimously; and all civilized countries realize the extent to which life is protected and wholesome living insured through the provisions of scientific medicine.

Ours is an unique heritage from a most ancient and accomplished profession. Are we, as trustees, doing our utmost to perpetuate and extend these doctrines? Is the public unmindful of its legacy through ignorance, indifference, or false teaching? Whose is the paramount responsibility to supplant ignorance with knowledge, indifference with interest, and false teaching with truth? The practitioners of medicine themselves!!!

In this review I have endeavoured to ascertain what would be the result if the doctrines of scientific medicine were applied in a maximum degree toward the conservation and preservation of personal health, and toward the alleviation and cure of existing disease. It must be obvious that the effect in prolonging life would be phenomenal; and in extending wholesomeness of living, and happiness in pursuit of life, inestimable. Our past and present methods have confined our activities to curative medicine, almost to the exclusion of preventive medicine.

Though it be impossible to speak with exact-

ness, it is a safe assumption that of the 130,000,000 people in the United States and Canada, one-half of those of reasoning age have no familiarity with the simplest fundamentals of the laws of health. While this proportion of our population is ignorant of the importance of health laws, it is again a safe assumption that false teachings by propagandists, and one or another reasons have led at least another one-fourth of our reasoning population to develop a positive antagonism to scientific medicine, and definite resistance to its services. Those who oppose scientific medicine thrive more or less successfully according to the advertising zeal of their leaders; they represent the various sects, cults, and organizations of proprietary and patent medicines.

If it is true that one-fourth of our population of reasoning age represents active opposition to curative medicine, and succeeds in avoiding its ministrations, here is a sound basis on which to estimate the effect of this on the health and mortality of the whole population.

Thus our favourable showing is possible with non-resistance or indifference of one-half of the population of thinking age. Estimating that one of every four resisted the services of scientific medicine—refused vaccination for smallpox, anti-toxin for diphtheria, and appropriate prophylaxis in the other preventable diseases—a large proportion of the present death rate in these diseases is avoidable and may be attributed to this resistance. An ultra-conservative estimate (under accepted methods of statistical study and mathematical calculations) will attribute to this one sin of omission 8,790.6 avoidable deaths in 1925, and 87,906 avoidable deaths in the ten years, 1915 to 1925.

The remedy is obvious. There must be continuous education. The fundamentals of scientific medicine, its practicability and acceptability, should be taught in the primary classes of our public and private schools, as early as the seventh or eighth grades. The fundamental principles of scientific medicine should occupy the same relative position of importance in the grade schools as grammar, general and physical geography, lower mathematics and English literature. The influence of these principles on personal and public health should be emphasized and reiterated, and knowledge imparted of the laws of general hygiene and sanitation.

A number of experiences in addressing school children convince me that education in the basic principles of scientific medicine would be accepted by them with great enthusiasm; and the heaven there sown would be of incalculable aid in lessening the existing ignorance and indifference toward the maintenance and promotion of better health. Moreover, in a dignified and proper manner it would be a potent factor in combating misinformation, which, uncurbed, develops into opposition to the truths of scientific medicine.

Preventive medicine and its counterpart, periodic health examinations, have been discussed since the earliest days of medical science. If

scientific medicine has established its right to assume the responsibility of supervising and maintaining the health of the people, it is a foregone conclusion that it should examine each and every individual at definite intervals, and give advice based on the findings.

Practical work along this line has been enthusiastically developed by the Metropolitan Life Insurance Company. Special semi-public organizations, conspicuously the National Tuberculosis Association and the American Society for the Control of Cancer, the former twenty-four years ago, the latter sixteen years ago, began to urge periodic health examinations so that the signs of the respective disease in which they were interested might be discovered early; and later their example was followed by the American Child Health Association, the American Social Hygiene Association, the American Heart Association, *et cetera*. Naturally it soon became obvious that preventive medicine could be more systematically advanced if the public were educated to accept a comprehensive periodic examination that would reveal the early sign of any disease instead of some particular disease.

The Great War emphasized the wisdom of thorough physical examinations, as every country which entered the conflict arbitrarily exacted a medical examination of its soldiers.

The medical corps of the Army, under General Gorgas, alone accepted for service, medically, 4,500,000 of fit men; and to secure this number it was necessary to examine approximately 7,000,000 young men. The difference in these figures represents those who were unfit.

These demonstrations, with examinations for special diseases, gave great impetus to the propaganda in favour of all-round periodic examinations. In 1919 and 1920 this organization, the American College of Surgeons, organized its sectional meetings, since which time we have held sessions in practically every state of the United States, and every province of Canada. The principal innovation is the carefully planned meeting for the laity at which, in simple language, the layman and woman are given information on the fundamentals of scientific medicine, and especially the advantage of periodic health examinations. The Gorgas Memorial Institute of Tropical and Preventive Medicine was organized in 1921. As the activities of the Memorial have developed, it has more and more urged upon the public the importance of seeking an annual health audit by the family physician.

EDUCATED PILOTS

The public should know what we know—that in a large number of our states, individuals are licensed to practice the healing art who are utterly ignorant even of the barest fundamentals of scientific medicine; cultists, some of whom have not even a rudimentary knowledge of the basic sciences, of anatomy, physiology, chemistry, bacteriology, pathology, diagnosis, or the other primary essentials of a medical education;

cultists, some of whom utterly ignore or denounce the necessity of possessing any knowledge whatsoever of these indispensable requirements. The various cults, under sundry names, have gained the sympathy of legislatures. By subtle sophistry, they have passed laws which require farcical examinations in one or another pathy or cult, authorized license to practice medicine or even surgery, and have caused them to be recognized as legal practitioners of the healing art, with all of the rights and privileges of the scientifically educated physician.

Of the forty-eight medical practice acts authorized by the individual states of the United States, only four require that an individual, to be licensed to practice the healing art, shall show by examination that he has a knowledge of the basic sciences upon which, obviously, the practice of the healing art should be grounded. This means that in the other forty-four states of the United States not requiring the basic science examination, only the graduates in scientific medicine meet these qualifications.

The basic science law requires that every practitioner of the healing art shall pass successfully an examination in the basic sciences before he is eligible to present himself as a candidate to the state board of examiners for a license to practice medicine or the healing art in any form recognized in the medical practice act of the respective state. The first section of the "Enacting Clause" reads:

BASIC SCIENCE CERTIFICATE REQUIRED. No person shall be eligible for examination or permitted to take an examination for a license to practice the healing art or any branch thereof, or granted any such license, unless he has presented to the licensing board or officer empowered to issue such a license, a certificate of ability in anatomy, physiology, chemistry, bacteriology, pathology, diagnosis and hygiene (hereinafter referred to as the basic sciences), issued by the state board of examiners in the basic sciences.

In obtaining thorough health examinations, how can we insure the independence of the family doctor, the personal internist, and the favourite surgeon? How insist upon a thorough and complete health audit, save the public from the exploitation of unworthy groups, stock companies, or even the well organized clinics or well equipped dispensaries or hospitals, and yet not lose to the personal physician his control of his own legitimate clientele? On this point even the exponents of the health audit have been most apprehensive, and their consternation has led them almost to the point of abandoning the program, lest in spite of its advantages the independent practitioner be put out of business.

The American College of Surgeons is successfully working out a remedy, a supremely practical solution of the problem, that will be satisfactory equally to the laity, the independent practitioner, public health officials, and the hospitals. Obviously, the difficulty lies in the fact that no one practitioner, regardless of ability and eminence, can individually overcome the prohibitive diffi-

culties and make a complete health audit, unless he has at his command competent aids, and intricate scientific apparatus and laboratories.

Where is the environment that will remedy this difficulty? Well organized groups; organized clinics; *the standardized hospitals.*

THE HEALTH INVENTORIUM

The "Health Inventorium" is planned by the College to meet this exigency. The suggested plan was submitted to one-tenth of the 1,805 hospitals in the United States and Canada on the approved list of the College in 1927. Almost without exception the plan was accepted. Thereupon, the plan was submitted to all hospitals on our approved list in 1927, and finally there is a thorough discussion of the subject at our hospital conference during this session of the Clinical Congress. The fundamentals of the plan have met with almost unanimous approval.

The detailed plan can be summarized but briefly here. It is as follows:

1. Every standardized hospital shall furnish an examining room or rooms, to which any legalized practitioner, who is a member in good standing of his respective county medical society and the American Medical Association, may bring a patient for examination. There shall be no charge for the examining room.

2. The hospital shall furnish to the practitioner every facility in the way of aids, consultants when necessary, laboratory tests, etc., as will insure a comprehensive audit of his patient's condition.

3. The charge for the required laboratory tests shall be nominal, and a maximum of actual cost.

4. The physician shall render to the patient a bill covering his fee for the examination, and where there is a charge for laboratory services, he shall be responsible to the hospital for its payment.

5. No hospital shall accord these facilities to any individual who is not accompanied by his or her doctor, or who does not carry a letter from his or her doctor in which certain services are requested.

6. An individual who applies for an examination and who has no physician should be referred to a duly appointed, disinterested committee consisting of a representative or representatives of the county medical society and the standardized hospitals of the community, and this committee shall advise the patient in the selection of a physician.

7. Except in dire emergency, no hospital shall treat a patient who was examined in the Health Inventorium, except by request or consultation with the referring physician.

THE DEMAND FOR HEALTH EXAMINATION AND ITS ACCEPTANCE

It is not surprising that life insurance companies should advocate and be ready to lend financial support toward popularizing periodic

health examinations. This commendation only emphasizes their importance. They recognize the movement as a substantial business asset, as it will extend the life of their policy holders, reduce the cost of insurance, and incidentally substantially increase profits. Are not these facts, substantiated by business sagacity, evidence that you and I, as policy holders, too, will profit in longer life and better health?

The approximate increase in demand for periodic health examinations with companies which give figures for 1920 and 1927, ranges from the encouraging figures of 549.5 per cent to 3,867 per cent.

Considering the short time occupied in the experiment, this is a showing that demonstrates a substantial interest by the people. Notwithstanding a reluctance on the part of not a few policy holders to accept the service on the ground that it is not an entirely disinterested activity, it is a movement that will develop incalculable health conservation.

Our College has been asked by a number of the important indemnity companies and industries who must provide protection to their employees to make a survey that will assist them to give the highest degree of protection to the employed in industry. As a result, through our Board on Traumatic Surgery, we made careful inquiry into the protective measures and health care that are provided to the great number of employees in large corporations.

While indemnity companies and state laws furnish protection to men who labour in the industries, in the last analysis, such indemnity protection is financed by the industries themselves. Wisdom and efficiency have led a considerable number of the larger corporations who employ labour to adopt methods of self-protection by furnishing to their men every facility that scientific medicine offers in the way of preventive and curative health measures; and similar facilities are provided also to their entire administrative force. The beneficent effect of this system in preserving health and furnishing the best surgical and medical aid in case of injury or illness is not of less importance because it results in a financial saving to the industries which furnish the aid; but it is the most substantial and effective commendation of scientific medicine and its relation to personal health.

Our survey indicates that this form of humanitarian service has increased enormously since 1920.

Labour has not been slow to recognize the importance of this movement. Samuel Gompers, outstanding statesman of labour, during his lifetime earnestly and continuously urged his great army of followers to ally themselves with scientific medicine. His worthy successor, William Green, the present President of the American Federation of Labour, is backing the program of our College to improve the status of industrial surgery and medicine. There is no power greater than organized labour to influence the advance-

ment and extension of scientific medicine. Following the demonstration of the care of men in industry, especially in the production of munitions and other materials for warfare, the average increase in yearly health audits among labour men, based on our survey, is approximately 95 per cent since 1920. This favourable showing is possible because most of the industries surveyed had similar service in 1920.

As early as 1905, Theodore Roosevelt, with his alert mind, looked with appreciative vision upon this problem of keeping physically fit; and, characteristically, he acted. Why have weak links in the United States Army, Navy, Marine Corps, and Public Health Service when by proper medical supervision the unfit units could be weeded out? From that time to the present the United States soldiers, sailors and marines have been submitted to regular physical examinations. The benefits of that program are now extended to the members of their families. By this regulation alone, over one million citizens are examined yearly and receive the benefits of preventive medicine.

In the last ten years, in my travels and talks at sectional meetings of the American College of Surgeons, I have found well organized educational departments in practically every state of the United States and every Province of Canada. With few exceptions primary schools, and authorities in higher education, are careful to note the physical well-being of pupils. It is an exception if the authorities do not insist upon vaccination against smallpox, examination of the throat, tonsils, hearing, and eyesight.

Our survey, done by questionnaire, which covers the health activities of the health authorities of eight cities of the United States having a population of not less than 250,000 each, may be summarized thus:

We have discovered that there is a growing interest in periodic health audits on the part of apparently healthy laymen, women, and children. We have learned our profession's wholesome interest in this subject.

With better facilities furnished to the general practitioner, through our Health Inventorium, and the increased demand for periodic health examinations on the part of the public, this preventive measure for conserving health and life will make notable progress in the next few years. Briefly, we note that there has been an increase, between the years 1920 to 1928, on a conservative estimate of reports, of approximately 1 to 1,000 per cent in examinations of apparently healthy individuals; that of the individuals examined, who were apparently well, from 1 to 100 per cent were harbouring unsuspected disease.

CURABILITY OF THE DEGENERATIVE DISEASES

The diseases of middle life and advancing age, already referred to, are now attracting the attention of scientific medicine. What are they? At what age do they manifest themselves? Can

they be postponed by thorough periodic audits? If they exist, can they be influenced by curative measures? And can the average limit of old age be advanced by careful surveillance, and scientific management?

These questions are important, not only to the scientific practitioner of preventive and curative medicine, but to every person, whether of early, middle, or advancing life, 33 per cent of whom, at the present time, succumb unnecessarily early, and in the interval between birth and death suffer needless ills that destroy the pleasure of wholesome and healthful existence. In the second part of our questionnaire this subject was dealt with most interestingly by 228 practitioners who honoured us with replies.

The range of years for the development of degenerative diseases appears to be from 15 to 75, with a large preponderance from 35 to 50 years.

216 replies were recorded; 73 report much good accomplished; 66 report modify and postpone (of these 30 included "cure" and 40 "prevent"); 35 report prolong life, increase efficiency; 6 report no benefit; 15 report fair; 13 report very little good; 8 report questionable.

The replies also, most of them from the leading, picked physicians of the United States, indicate a very great interest in degenerative diseases, and a belief that their course could be modified and postponed through these examinations.

FINAL SUMMARY

(a) Estimated number of periodic health examinations of apparently healthy individuals—in 1920, 5,000,000; in 1927, 20,000,000; (b) One-third of the deaths in 1925 (or 502,083 deaths) are attributable to degenerative diseases of middle life and old age; (c) Degenerative diseases manifest themselves at average age of 45 years; (d) 236 replies from eminent internists, and 18 replies from general practitioners, indicate yearly examinations would modify and postpone the degenerative diseases, and increase longevity and the maximum old age limit; (e) 35 per cent of apparently well individuals receiving periodic health examinations are found to harbour some form of unsuspected disease or physical defect; (f) 90 per cent of our replies from internists and outstanding clinics reveal that patients are advised to submit to periodic health examinations; (g) Labour in industry, employes in governmental and civic organizations, pupils in elementary and secondary schools, colleges and universities, practically all receive and welcome some form of periodic supervision, advice and service, and at least an additional 17,500,000 receive complete periodic examination service; and an estimated additional 3,000,000 men and women, not included in the above, brings the grand total to 20,500,000.

The above figures, while not conclusive, indicate the enormous interest that is developing in the subject of periodic health examinations. However, this is not a guarantee that all of these examinations now are to the highest degree com-

prehensive and efficient. The figures do indicate the lay public's receptivity to this important innovation. And their acceptance of the ministrations of scientific medicine places upon the profession a responsibility that should induce us to give a one hundred per cent service.

THE INFLUENCE OF THE PHYSICIAN WITH THE PUBLIC

A mistaken policy of silence, and a tradition of non-communicability in discussing the health problems of our patients, has militated against our full influence with the public. No profession, not even the ministry, can more effectually guide a large proportion of the community on a private or public policy. When we fail to exert this prestige, it is the fault of our profession and not of the public.

We have had three outstanding illustrations of this statement:

1. In 1920 the irregular practitioners of the healing art, the patent medicine venders in California, backed by subsidized newspapers, attempted to prevent animal experimentation in the teaching of medicine within the state. The scientific medical profession was aroused, the educated and sane people of that great state rallied to their support, and the antagonists of scientific progress were completely routed.

2. In 1922, a similar belligerent campaign against scientific medicine occurred in Colorado. For a time it appeared that the qualified doctors would have to forfeit those requisites which are indispensable to the teaching of their profession, and that the legislators of an important state were to turn thumbs down on the progress of civilization. Again, the scientific medical profession was aroused, exerted its influence, took the public into its co-operation, changed the tide toward sanity and common sense, and completely routed the opposition.

3. In 1921, Massachusetts, indifferent to the growth in its midst of the most subtle forms of irregular practices, found these same cults, who repudiated the conventions of civilization and considered themselves strong enough to terminate the teaching of scientific medicine, were organized to stop animal experimentation in the teaching of medicine. Slowly, but eventually, the profession of scientific medicine was aroused—they gained the co-operation of their patients, and together they routed the knights of unrighteousness beyond redemption.

The profession of medicine exerts a powerful influence, and can, if it will, convince at least 75 per cent of our people that it is their inalienable right to be kept well, and that the scientific medical profession is the one authentic, accredited, and competent agency equipped to keep them well so far as is humanly possible.

Lay people, in the majority, are waiting for us to take the lead in the practice of the healing art; to halt our mysterious methods, and give them face to face facts and guidance so that they may be maintained in good health.

GENERAL SUMMARY

1. The profession of scientific medicine, organized before the advent of Christianity, is the oldest of learned professions. Spiritually, morally, and scientifically, in all civilized countries, it is outstandingly the recognized authority in the prevention and cure of disease. Like the great religions of the world, it recognizes no geographical or political bounds, but unlike the great religions, it has no competitors. It is the one authority in scientific medicine recognized by all civilizations.

2. For centuries scientific medicine was practiced as an art and every scientific truth employed to make its authority more worthy and reliable. With the development of the exact sciences, it has strengthened its art and made more definite its authority and accomplishment by appropriating the proved truths of modern science, until it is now known, and properly so, as the science of medicine.

3. As we have shown, problems of disease, one after another, have been and are being conquered, and not only the trained physician has this knowledge, but the educated layman, too, is prepared to accept preventive and curative scientific medicine as the recognized authority; and rapidly the public is improving the opportunity to keep fit and submit to periodic surveillance by the practitioner of scientific medicine.

4. The thorough physical examination of millions of soldiers in the Great War, proved the value of scientific medicine, and convinced millions of men of the wisdom of a periodic physical audit, under the supervision of scientific medicine, to keep themselves well. Through systematic propaganda advocating preventive medicine to conserve personal health, the general public has become aware of the value of periodic health examinations; labour has been convinced of the value of keeping well; and the industries, as an economic asset, have been induced to establish scientific facilities to keep their employees to the highest degree in good health.

5. Change of opinion has been wrought in the minds of the laity, in their attitude toward the relative wisdom of periodic audits to preserve health, rather than to wait for illness to make evident a possible incurable condition. A wholesome evolution in the practice of medicine is resulting, and it promises to become a boon that will preserve personal health to the maximum degree, and afford satisfaction to the scientific practitioner of medicine because of ability to practice his profession with greater precision and success.

6. The American College of Surgeons has occupied an important position in this movement, which must command the support of the teachers of medicine, the practitioners of medicine, the authoritative societies of medicine, the journals of medicine, and through all dignified means of publicity, it must educate the public to the necessity of co-operation with scientific medicine

if they are to be protected from illness, and if the happiness of their lives is to be enhanced.

7. Statistics show that 25,112,309 individuals in the United States are employed in the industrial occupations. According to our limited survey, one-half of these individuals receive medical service and periodic supervision; conservatively we estimate that of the total employed only one-fourth receive this service, or 6,278,077.

In the U. S. Army, Navy, and Marine Corps 250,188 of their personnel receive this thorough service, which is extended also to the members of their families. On the basis of four members in each family, this brings the estimate to 1,000,752.

There are in the elementary and secondary schools, universities, colleges and professional schools, (continental United States) 27,381,816 pupils and instructors. Our survey shows that three-fourths of these receive medical service and periodic supervision, but conservatively we estimate only three-eighths, or 10,268,181.

SUMMARY

Individuals in industrial occupations who receive complete medical service and periodic supervision (estimated).....	6,278,077
U. S. Army, Navy, and Marine Corps, and members of their families (estimated).....	1,000,752
Pupils and instructors in elementary and secondary schools, universities, colleges, and professional schools of continental United States (estimated).....	10,268,181
Further, it is estimated that an additional 3,000,000 men and women, not included in the above, receive complete and thorough periodic health examinations.....	3,000,000
Total in these four classifications who receive medical service and periodic supervision (estimated).....	20,547,010

8. Through our recent research and study with the industries, labour, insurance, indemnity companies, governmental, state, county, and civic authorities, our universities, colleges, high schools, and primary schools, and others in their preventive health activities, from our direct questionnaire to our most influential practitioners of medicine, there is convincing evidence that the public is rapidly accepting the policy of co-operation with scientific medicine, and the practitioner of medicine is more and more willing to do his part, all of which offers conclusive proof that within the next ten years, the momentum of this evolution will find 30,000,000 of our people accepting the program of early health audits to conserve personal health, as readily as they now accept the protection provided to the masses by public health activities.

9. The health inventorium—which brings into the strong trinity of co-operation the scientific medical practitioner, the standardized hospitals, and the laity—when thoroughly understood

and accepted, will insure to every practitioner adequate facilities to make thorough examinations and to the public a thoroughly reliable service.

10. The questionnaire to internists and general practitioners reveals a keen interest in observation and study of the insidious diseases of middle and advancing age—the degenerative diseases, and most of them have expressed the definite opinion that yearly or semi-yearly health examinations will reveal these diseases in their incipency, afford opportunity to modify and postpone the progress of many of them, and definitely prevent the development of some of them. Inasmuch as one-half of our yearly deaths are attributable to diseases which reap their harvest in man's years of greatest usefulness, the significance of this authoritative information is apparent.

11. This review of the evolution of the progress of clinical medicine and surgery emphasizes our responsibility as practitioners of medicine. We must give service to the utmost of our ability, and with the lay public must rest the responsibility of accepting it. Volunteer acceptance will:

- Preserve rather than restore the health of 100 per cent of the people, to the greatest degree possible through the sciences;
- Require that practitioners of medicine be educated in the basic sciences before they may be licensed to practice the healing art;
- Make readily available to medical schools all facilities necessary to teach scientific medicine, and to preserve modern research methods in the laboratories by animal experimentation;
- Employ all dignified publicity methods, guided by scientific medicine, to enable the public to recognize the reliability of scientific medicine and to distinguish it from the subtleties of uneducated pretenders and imposters.

12. This review estimates that approximately one-fourth of the laity are now indifferent to the benefits of scientific medicine, and that approximately another one-fourth are antagonistic to it, the victims of sophists, quacks, and other unscientific practitioners. While this affects detrimentally the individuals of adult life whose wisdom should guide them to choose judiciously, and with whom it is futile to protest, unfortunately it also affects their innocent children and dependents, and results in much unnecessary sickness and many premature deaths. The increased health rate, and the number of lives saved in 25 years of this century by the application of scientific medicine, proves that the refusal of this large proportion of our people to accept our aid without doubt accounts for much unnecessary illness and suffering, and at least 17,581.2 preventable deaths each year.

13. More than two-thirds of our people morally and spiritually favour the 18th Amendment to the Constitution of the United States. In spite of the injudicious administration of this 18th Amendment, which has resulted in an orgy

of law-breaking, of self-indulgence, and ridicule on the part of the other one-third of our citizens, the foundation has been laid for a demonstration of race betterment and extension of life that will astonish the world.

14. It is my wish that this review may aid to convince the people that one-half day each year should be set aside for a comprehensive health audit of each member of every family. As physicians we know the essentials, and the details of scientific medicine. We believe that the layman and woman from childhood should have a convincing knowledge of the essentials of preventive medicine. This knowledge must be imparted by dignified publicity methods; by teachers who are educated physicians. If this reasonable program is accepted and acted upon (and the present attitude of the people indicates that it is being accepted and adopted), I predict that our estimate of longevity will show an increase from 58 years in 1920, to 65 years in 1930, and what is of greatest importance, a decrease in preventable illness that will add immeasurably to the wholesomeness and happiness of more than 100 millions of people in the United States and Canada.

THE MONTREAL HEALTH SURVEY

BY A. GRANT FLEMING, M.B.

Montreal

Montreal citizens in increasing numbers have, for some years, been dissatisfied with health conditions in their city. Voluntary health organizations and other groups have striven from time to time, by education and demonstration, to awaken the general public and the city administration to the situation. The result of their efforts has been an increasing interest in and understanding of health conditions and a desire to take some action to rectify the state of affairs. Added to this was the stimulus of the late typhoid fever epidemic.

The Montreal Anti-Tuberculosis and General Health League deemed that the opportune time had come for making a health survey of Montreal, and that it would be advisable to have such a survey sponsored by a group of representative business and professional men, who, as a group, were not associated with any particular health agency. An invitation to form such a committee was extended through Sir Arthur Currie, Chairman of the Health League. The Montreal Health Survey Committee is composed of the following: The Right Honourable Lord Atholstan, LL.D.; E. W. Beatty, K.C., LL.D.; Lyon Cohen; Louis S. Colwell; Sir Arthur W. Currie, G.C.M.G., K.C.B., LL.D.; Ernest R. Décary, N.P.; Hon. P. R. duTremblay, M.L.C.; J. T. Foster; J. A. Francoeur; Sir Charles Gordon, C.B.E.; Louis deLotbinière Harwood, M.D.; Sir Herbert S. Holt, LL.D.; Beaudry Leman; C. F. Martin, B.A., M.D., LL.D.;

J. W. McConnell; Edouard Montpetit, LL.D.; Hon. J. L. Perron, K.C., M.L.C.; Hon. Donat Raymond. A technical committee of three Montreal health specialists, Doctors J. A. Baudouin, A. Grant Fleming, and R. St. J. Macdonald, was formed to collect the material to be studied, to prepare a report based on this material and to make recommendations.

By consulting with individuals and groups working in the various agencies engaged in particular health functions, it was possible to gather practically complete information on the services being rendered, and so to verify the quality and extent of the services as indicated in the reported figures. The staff of the General Health League was placed at the disposal of the Committee for work in connection with the survey, the cost of the survey being met by the Health League.

The Field Staff of the Committee on Administrative Practice of the American Public Health Association was engaged in a consultant capacity, and the technical committee acted under their guidance and direction. The appraisal of City Health work was made by the consultants, using the Appraisal Form for City Health Work of the American Public Health Association. Doctor C. E. A. Winslow is chairman of this Committee; Doctor W. F. Walker, Field Director; and Miss E. L. Smellie, Chief Superintendent of the Victorian Order of Nurses for Canada, was attached to the Field Staff for purposes of the Montreal Survey.

Assistance was received from many individuals and organizations. Special reference is made in the report to such assistance from Dr. S. Boucher, Director of the Department of Health; from Dr. F. G. Pedley, in Industrial Hygiene; from Dr. W. T. B. Mitchell, in Mental Hygiene. The full report is being published through the courtesy of the Metropolitan Life Insurance Company, and will be distributed shortly.

From the Report, the following items have been selected as of special interest to the medical profession.

A comparison of expenditures of Municipal Health Departments for 1927 shows Montreal's expenditure as 39 cents per capita, and the average of twelve large cities of the United States as 78 cents per capita, ranging from 50 cents to \$1.18. The total health expenditures in Montreal by official and voluntary agencies are given in tables and show the total expenditure as \$1.81. This, however, includes the cost of bedside nursing services and of the hospitalization of communicable diseases and tuberculosis. If this be deducted, an expenditure is shown of 69 cents per capita, by voluntary and official agencies, on what are considered as health expenditures in most communities.

A study of mortality trends for Montreal shows an unmistakable saving in lives, particularly in the early age group. Judged with other cities of comparable size, the condition is not satisfactory. The tuberculosis death rate of 126;

the infant mortality rate of 113; the total diarrhoea and enteritis deaths (under two years) of 870, are high in comparison with other cities.

The appraisal is based upon standards arrived at after careful and complete studies of many cities. The standard set is such that 25 per cent of the cities studied would attain a perfect rating. The goal is not, therefore, idealistic and unobtainable, but one which may be closely approached by any city with a well-planned and properly directed public health program.

SCORE OF PUBLIC HEALTH ACTIVITIES

Activity	Montreal's Percentage
Vital Statistics	72
Communicable Disease Control	54
Venereal Disease Control	60
Tuberculosis Control	55
Maternity and Ante-Natal Hygiene ..	88
Infant Hygiene	64
Pre-School Hygiene	88
School Hygiene	49
Sanitation (Water and Sewerage) ..	94
Laboratory	34
Milk Control	57
Food Control	53
Popular Health Instruction	45
Average Total	62

This score means that the combined effort of Montreal's official and voluntary health services measures only about two-thirds of the best examples of such services in other cities of comparable size.

Certain activities, such as mental hygiene, industrial hygiene, and cancer control, the public health practices concerning which have not been sufficiently standardized to permit of appraisal, are not scored, but are dealt with in the report.

RECOMMENDATIONS

It is recommended that the island of Montreal be organized as a health unit, because of the advantages obtainable from a uniform control of this natural unit of administration. In the event of the adoption of a Borough System of government for the island, it is argued that Public Health should be one of the centralized services.

It is recommended that where the public authority delegates to voluntary agencies its responsibility for the care of the public health, the city and the province each contribute one-third of the agencies' expenditures on health work of proved value, carried on according to a standard set by the public authority. In any case, the sums of money which are distributed should be allocated on a service basis.

In a discussion of "Whom Should the Department of Health Serve?" it is stated that Community Health Service should be offered on a community basis without regard to the economic condition of the person served. Also, that in advising this, it is intended that physicians in health clinics be paid for their services.

It is recommended that a Board of Health of

five members be instituted. That the University of Montreal and McGill University each nominate two members who, together with the Chairman of the Executive Committee of the City Council, shall be appointed as the Board of Health.

The advisability of dividing the city into sanitary districts with a health centre in each district, and the advantages of a bi-annual census based on these districts are emphasized.

To provide the Department of Health with prompt notification of births, provision for which is not made under the present system, it is advised that the reporting of births by physicians be enforced, and that a fee of 15 cents be paid for each report.

The reporting of communicable diseases is much below the standard of other comparable cities.

In regard to diphtheria immunization, it is recommended that, in addition to free distribution of the material for immunization, the sum of \$1.00 be paid to physicians for every pre-school child they report as having immunized. The cost to the city of hospitalization of diphtheria cases is more than \$100,000.00, which would pay for the cost of immunization of the present pre-school group at once; the cost thereafter would be \$20,000.00 per year.

The establishment of culture stations throughout the city, a public health laboratory service for all citizens, and free biological products, are recommended.

It is recommended that the use of silver nitrate, or some similar solution, in the eyes of the new-born be required; that diphtheria cases and contacts be released only upon negative cultures, instead of at the end of a fixed period as at present; the release from supervision of typhoid fever cases to be determined by negative cultures of stools and urine.

Approximately one per cent of the population come as new cases each year to the Venereal Disease clinics. It is recommended that the reporting of cases by number be required by law, and also provision for compulsory treatment or isolation of those failing to take treatment in a satisfactory manner. Also, that there be a social service in connection with the clinics.

The problem of tuberculosis is indicated in the 886 deaths. There are available 573 beds for indigent cases; there is no satisfactory provision for the institutional care of tuberculous children, no preventorium care, no open-air schools as part of the school system. The need for 350 additional beds for tuberculous indigents is pointed out, and the need for provision for institutional care of children, of preventoria, etc.

It is recommended that the Department of Health provide a diagnostic service in the home, upon the request of attending physicians, for cases unable to attend at one of the tuberculosis institutes.

Montreal's maternal mortality rate of 3.8 is comparatively satisfactory. Considerable work

is being done in this field, and the results are evident. Thirty-five per cent of the city's ante-natal cases have some ante-natal home nursing supervision; 13 per cent were under clinic supervision. The Victorian Order of Nurses attended 7.7 per cent of births; the Royal Victoria Montreal Maternity Hospital and L'Assistance Maternelle, 3.6 per cent of births occurring at home. The report states that, considering housing conditions, more than 16 per cent of births should occur in hospital. The need for further development of existing services and for the registration and supervision of licensed midwives is stressed. At present, midwives are licensed by the College of Physicians and Surgeons, but there is no local registration of those practising, and no supervision. (This is not an endorsement of midwives, but it is thought that as long as they are licensed, they should be supervised).

The infant mortality rate in 1927 was 113; the rate for French-Canadians, 144; British-Canadians, 55; Jews, 26. It is recommended that, working in and from every well-baby conference, there shall be at least one graduate registered nurse. The lack of such personnel handicaps the infant welfare work, which is extensive, though varying greatly in quality.

An extensive review of the system of School Medical Inspection Service is presented. The school population is 126,000. There is no dental service. It is recommended that such a service be organized and a staff of 20 dentists, with a similar number of dental assistants, be provided.

The need in Montreal for special classes is estimated as provision for:

2,200 children in classes for mentally-handicapped; 1,260 children in open-air classes; 500 children in summer open-air schools (Forest Schools); 250 children in sight-conservation classes; 125 children in crippled children's schools.

Based upon the number of individuals who are to be served, the estimation being made upon the number of cases of communicable disease, tuberculosis, venereal disease, the number of births, the school registration, etc., it is estimated that Montreal requires 184 public health nurses (not including bed-side nursing service), and of this number, 132 should be on the staff of the Department of Health. On May 1st, the Department had 46 public health nurses. Some eighteen recommendations are made as to public health nursing, covering the needs of this important service.

Programs for Industrial and Mental Hygiene are presented. The need for amendments to the Housing By-Law are detailed. It is recommended that 50 additional neighbourhood playgrounds be provided. The situation regarding Cancer and Heart Disease is described, and certain recommendations are made, including a free pathological diagnostic service for cancer, the follow-up of communicable diseases to urge supervision by the family physician, the provision for adequate convalescent care and popular health instruction.

Chapters are devoted to a consideration of the Milk and Food Supplies and Popular Health Education.

The Report concludes with a suggested budget for the Department of Health, based upon the recommendations made, proposed by the Committee as a three-year program.

The expenditure in 1927 was \$274,201.58; the recommended budget is \$638,640.00; which is 91 cents per capita on the basis of a population of 699,500.

HEALTH DISTRICTS*

By M. M. SEYMOUR, M.D.,

Regina

Saskatchewan was created a province in 1905, but used the North West Council Ordinance passed in 1902 for health matters until the enactment of the Public Health Act in 1909 which provided for the establishment of a Bureau of Public Health.

In 1923 the Department of Public Health was created, and in 1927 was amended, making provision for the formation of Health Districts.

In the two largest cities of the province there is a full time medical health officer, who is assisted by such technical help as the size of the city calls for and its council can be persuaded to provide. In the smaller cities the medical health officer is a local practising physician, who gives more or less of his time to public health for little or no pay. As a rule, the part time medical health officer has no training in public health except that which he acquires by experience. Often he loses practice in communicable diseases because people find that they are shut in by the medical health officer but may escape if seen by another doctor. All these factors; poor pay, want of co-operation, lack of education of public opinion, scanty funds, contribute to render part-time medical health service of little value to the community. Places that have a full time medical health officer develop a useful organization.

By an amendment, which was assented to March 7th, 1928, the Saskatchewan Legislature enacted that the minister may prepare a scheme for the organization of Health Districts, consisting of a number of municipalities, and may submit the same for the approval of their respective councils. The amendment goes on to say that there shall be not less than eight rural municipalities in a district, and towns with a population of less than 10,000 shall be included. The scheme shall provide for the appointment of

* Summary of an address by Dr. M. M. Seymour, former Deputy Minister of Public Health, Saskatchewan, now Special Adviser on Public Health to the Saskatchewan Government, delivered at the Regina and District Medical Society, September 5, 1928.

a medical and sanitary staff, consisting of a qualified medical practitioner, one or more sanitary inspectors, one or more trained nurses, and a secretary, who shall devote their whole time to the health and sanitation of the district. The scheme shall give an estimate of the expense involved and shall state that one-half the expense is to be borne by the municipalities. The minister shall submit the scheme to the councils of the various municipalities for their approval; the councils shall consider it and approve or disapprove at the first regular meeting held after the receipt of the scheme from the Minister.

The cost for the District will be \$14,000 a year. Fifty per cent of this is to be paid by the rural municipalities, towns, and villages in the district; 25 per cent will be paid by the Department of Public Health, Saskatchewan, which also makes all appointments, directs and controls the work; 25 per cent will be paid by the Rockefeller Foundation, which will also pay for special training given to the personnel. The average cost per capita will be 35 cents.

The Health Unit will control communicable diseases, improve sanitary conditions, regularly inspect school children, make recommendations for the correction of defects, consult with teachers on all matters pertaining to personal hygiene and personal health, stimulate interest among adults in periodic health examinations, arrange for vaccination and immunization of school children and others, conduct clinics for pre-school children, hold pre-natal clinics and public health meetings, visit the homes and give instruction there.

The use of the laboratory will be made available without charge to local practitioners.

The district of Assiniboia is to have one of the first Units. In 1926 there were 187 deaths in this district; study of the mortality returns show that 119 of these deaths were from preventable causes. Four hundred and twenty persons were sick each day of the year in the district.

In 1926 there were three hundred and eighty-two deaths reported from tuberculosis. Authorities say that for every death from tuberculosis there are from five to ten cases left behind infected with the disease in a communicable state. Saskatchewan has 600 beds for the care of tuberculosis. Multiplying the number of deaths mentioned above by the lower figure, namely, five, we have 1,910, and 600 beds for 1,910 leaves 1,310 cases of tuberculosis in the communicable state in the homes of Saskatchewan. The personnel of the Health Unit will be made aware of where the homes in the district are from which the patients have gone to the Sanatorium. Inmates of these homes will be carefully examined by the physician who will give advice as to how the sick ones should care for them-

selves and how they can take precautions to prevent communicating the disease.

Heart disease and its prevention will be another interest of the Unit.

Denmark, Sweden, Italy, and Switzerland have maternal mortality rates of between two and three per thousand; Canada has an average of between six and seven per thousand.

Immigration from other countries is receiving much attention, yet 26,000 of our own newcomers, that is babies born in Canada, die every year before they are twelve months old.

The Health Units are designed to promote the conservation of that most valuable possession, human life.

THE WORKMEN'S COMPENSATION ACT OF THE PROVINCE OF QUEBEC

By F. J. TEES, M.C., B.A., M.D.,

Montreal

To the Province of Quebec belongs the credit of being among the pioneers in workmen's compensation legislation, the Act of 1909 being one of the first of its kind. Recognizing however that many of the provisions of the original Act had become obsolete, the provincial legislation, after unhurried consideration, recently introduced a completely revised measure which became effective on the first day of September, 1928.

By the new Act a Commission of three is established, with full jurisdiction to interpret and administer. This supersedes litigation in the Courts with its associated delays and other undesirable features, prominent among which has been the evidence given in the witness-box by medical "experts," frequently conflicting, oftentimes detracting from the dignity of the profession.

Indemnities for permanent total incapacity, for permanent partial incapacity and for temporary total incapacity, have all been materially increased; in the event of death, a "rente" equal to 30 per cent of the yearly wages is granted to the widow, with an additional allowance of 10 per cent for each child (30 per cent maximum) under the age of sixteen.

The injured person is entitled to all medical, surgical, pharmaceutical, and hospital charges, (according to a tariff which has been approved by the Lieutenant-Governor-in-Council), as well as to transportation to the nearest hospital. Where there is more than one hospital, the injured person may select one of his own choice.

The clause relating to the choice of medical attendant reads as follows: "The employer must procure for the injured person whose mother tongue is French or English, the services of a

physician, and, if required, of nurses speaking his language."

To guarantee the payment of indemnities and expenses the employer is obliged to obtain insurance with an insurance company approved of by the Commission. Provision is made, however, at the discretion of the Commission, for certain companies to act as self-insurers, adequate guarantees being demanded.

Notice of an accident must be given to the employer by the injured within ten days. In the case of an accident entailing incapacity for more than seven days, the employer is required to notify the Commission within fifteen days. Many minor accidents will accordingly not become the concern of the Commission. If the incapacity lasts less than seven days the injured person is still entitled to medical attendance. Payments for temporary total incapacity at the rate of two-thirds of the daily wages begin only on the eighth day after the accident unless the incapacity exceeds six weeks in which case the first week will be compensated for.

A schedule has been prepared indicating degrees of permanent partial incapacity in re-

spect to certain injuries. In cases not provided for in the schedule this is intended to serve as a guide, taking into account "the injured person's capacity to continue the same kind of work as he was doing before the accident or to take up another kind of occupation."

With so many interests touched by legislation of this kind—those of the employer, the employee, the insuring companies, the medical and legal professions—it is not to be wondered at that differences of opinion should arise concerning certain minor details of the Act, but the new enactment is recommended to the study of those interested in industrial medicine as a constructive measure. There are those, who, having given much study to corresponding acts in various countries, believe that the Quebec Workmen's Compensation Act of 1928 embodies legislation that for fairness and practicability leaves little to be desired. The members of the medical profession of the Province are recommended to familiarize themselves with the details of the Act and to give a full measure of support to the Commission in the onerous task which they have assumed.

Men and Books

AN EARLY CANADIAN BIOLOGIST— MICHEL SARRAZIN (1659-1735): HIS LIFE AND TIMES*

By MAUDE E. ABBOTT, B.A., M.D.,

Montreal

The *David Prize* for the best essay on Canadian history was awarded for the year 1926 to Dr. Arthur Vallée of Quebec, for a brilliant biographical and historical study bearing the above title. Published in the following year, 1927, by the King's Printer, as one of the series of the *Quebec Archives*, this work forms a neatly bound volume of 299 pages, of which 220 are occupied by the monograph itself and the remainder by an appendix containing a selection from the original documents on which it is based (*Pièces justificatives*), the latter forming not the least valuable part of a very important publication.

The appearance of this book is a real event, not only in Canadian medicine itself, but in the history of medicine on this continent as a whole,

for it covers a period in which civilization was successfully replacing barbarism throughout all the then known parts of North America, and it unfolds a chapter from the history of this time that until now has been but too little understood and quite inadequately portrayed. As its title implies, this book not only rescues from partial oblivion the name of an illustrious pioneer in medicine and biological research, whose achievements were well abreast of those of any of his contemporaries in these fields on this side of the Atlantic; it also presents a clearly defined picture of the practice of medicine in contemporary French Canada, in what is now the Province of Quebec, during the latter part of the 17th and early 18th centuries, some one hundred and fifty years after its first settlement. In this district, amid a scattered population that numbered at this time about 15,000 souls, nurtured under the ministry of the Catholic Church and her devoted sisterhoods, but unprotected as yet by the Act of Registration of 1788, a great variety of practitioners, regular and irregular, flourished. Among them were a few qualified barber-surgeons with experience gained in France, and their apprentices, as well as other persons of honest purpose, locally trained or self-educated, whose scanty knowledge was eked out by their gift of commonsense, as well as midwives trained in France or practising untrained. To these were added a host of

* *Un biologiste Canadien, Michel Sarrazin (1659-1735). Sa vie, ses travaux, et son temps.* Par Arthur Vallée, Professeur à l'Université de Laval. *Prix de Concours de l'Histoire de Canada, 1926. Archives de Québec.* Imprimé par L. S. Proulx, Imprimeur du Roi, Québec, 1927, viii, 291 pages. Published also by La Librairie Garneau, paper cover.

charlatans, whose trade thrived upon the credulity of the people and the quaint beliefs and customs of the time. Among this heterogeneous crowd of worthy and unworthy followers of his art, the name of Michel Sarrazin, physician-in-chief of the King to the hospitals of New France, student of the École de Médecine of Paris, and Doctor of Medicine of the University of Rheims, Corresponding Member of the Académie Royale des Sciences, contributor to its Transactions of original dissertations on the anatomy and physiology of animals indigenous to Canada, and donor to the Jardin Royale of Paris of living specimens of practically the entire Canadian flora of his vicinity, stands out pre-eminent, as does that of his great successor in the next generation, Jean-Théophile Gauthier.

Dr. Vallée explains in his introduction that, in order to depict the figure of this ardent research worker and foremost physician of his generation from the scanty material available, he has considered it essential to reconstruct as far as possible his environment, and to recall the status of the art and science of medicine at that time, both in Old and New France, as well as the more important personnel of the medical confraternity by whom he was surrounded during his fifty years of active professional life at Quebec and Montreal. For this purpose, as well as for that of the biography itself, he has made a careful research in the Dominion and Provincial Archives, in the Paris offices and libraries, and in the *Bulletin des Recherches Historiques* and elsewhere, for documentary evidence of all sorts, reference to which is shown throughout the book by footnote or annotation. The time has passed, he writes, for the birth and origin of Canadian history to rest on legendary tales or unsupported tradition. The occasion has arrived for the scientific presentment of historical facts based only on actual documents and on those precious but all too scanty records of old families and their dependencies which constitute the true background of the Old Régime in Canada. Unfortunately, apart from the Public Archives, little remains of a personal nature that could initiate us into the private life of Sarrazin, or reveal anything of his physique or character. Apart from his scientific publications, all that we have to go upon of a personal nature are several letters, thirteen in number, dealing with his administrative functions or scientific work, discovered at the *Académie des Sciences*, the *Bibliothèque de Rheims*, the *Séminaire de Québec*, and the *Bibliothèque Nationale*. All the more necessary has it been, therefore, to review the few data that we have of his life in the social, political, religious, scientific, industrial and commercial setting of his time and place, where we can see him in his true values in very close proximity to those great names who in that era built the history of New

France. "Here it is that we have tried to retrace Michel Sarrazin de l'Etang."

The Foreword closes with an appeal to his French compatriots to be worthy of the high tradition that is unfolded to them in this book and to follow Sarrazin in making a definite contribution from French Canadian medicine to the science of the world. It may well be transcribed here.

"Car à côté des gloires militaires et politiques, ecclésiastiques et sociales, il reste le prototype de la science des premiers jours, et peut-être de toujours à date, au pays de Québec. Or la science fait partie de l'histoire du monde. Au même titre que les arts et les lettres, elle a sa place dans la suite des temps. . . . Et nous voudrions en citant Sarrazin aux générations montantes, provoquer dans les esprits la réaction nécessaire à l'éveil scientifique national. . . . L'homme qui dans son lourd labeur a voulu porter une attention spéciale aux deux éléments qui devaient plus tard constituer notre emblème: le castor et l'érable, semble bien mériter qu'on se souvienne de lui. Nul ne peut à plus juste titre devenir le guide de ceux-là que, suivant son exemple reprendront le sentier tracé pour fournir à leur tour l'apport de la science canadienne-française à la science mondiale."

Who then was Michel Sarrazin, and what were his contributions to the science and life of his time? And what insight does Dr. Vallée's book give us into the practice of medicine in this country before the English conquest of 1760?

A reply may best be given by tracing briefly below the thread of Dr. Vallée's narrative. It must be understood, however, that in order to do justice to this subject the book itself must be read and studied by all those interested. For it is a classic in its line, as concise and authoritative as it is romantic and informing; and is moreover a pioneer achievement in a virgin field—the first authentic history of medicine in French Canada.

I. THE COLONY AT THE END OF THE SEVENTEENTH CENTURY

ORIGIN OF MICHEL SARRAZIN

Michel Sarrazin was born on September 5, 1659, at Nuits-sous-Beaune in Burgundy, the son of Claude Sarrazin, bailiff of the estates of the Abbaye des Cîteaux and of Madeleine de Bonnefon his wife. These names are met with some two centuries earlier in Upper Burgundy, the country of Buffon and Daubenton. He arrived at Quebec in the summer of 1685, at the age of 26, bearing the title of surgeon, on a ship carrying a marine detachment (so-called after the ministry that despatched them). He thus formed a part of the large immigration to Canada of the sturdy Burgundian race that began in 1675 and permeated the colony in the early 18th century. Another surgeon of the same origin, Jacques Desquay, preceded him by thirteen years and settled at Three Rivers. Sarrazin's arrival in Quebec coincided with that of the Abbé de St. Valier and the Intendant Denon-

ville, and it is probable that his services were immediately called upon in the epidemic that broke out among the accompanying regiment, and for other exigencies of the colony; for the following year, September 12, 1691, he was appointed by the Conseil Supérieur, Surgeon-major to the troops in Canada. This was ratified by royal mandate from Versailles five years later in the following terms:

"Aujourd'hui 16 mars 1691 le Roy estant à Versailles voulant commettre une personne capable et expérimentée au fait de la chirurgie pour traiter et panser les soldats des troupes qu'Elle entretient au pays du Canada, et sachant que le Sr. Sarrazin a les qualités nécessaires pour s'en bien acquitter, Sa Majesté l'a retenu et ordonné, retient et ordonne chirurgien des troupes qu'Elle entretient au dit pays aux appointemens qui luy seront ordonnez par les estats qui sont expédiés chaque année pour l'entretien des dites troupes et autres dépenses à faire au dit pays pour le service de Sa Majesté. Mandé au Sr. Comte de Frontenac, etc."

The colony at the time of Sarrazin's first sojourn in Canada (1685-1694) could no longer be considered uncivilized, but it rather mirrored, in spite of material difficulties, the life of the period in the Provinces of Old France. The population was already divided into parishes with larger centres at Quebec, Montreal and Three Rivers, and to these was coming an incessant influx of colonists of high as well as low degree. Law and order was maintained by the institution of the *Conseil Souverain de Québec* (later the *Conseil Supérieur*), which enforced the edicts and ordinances of the French rule and judged the difficulties of the community as they arose. This Council, formed as it was of the élite of the country, and numbering on its roll all the great names of the colony, constituted a local aristocracy of high repute. The clerical administration was organized on a peculiarly liberal basis for that epoch, with secular and regular clergy, while education was cared for by primary schools, a preparatory Seminary and Jesuit College at Quebec and the Sulpicians and others at Montreal. In spite of monopolies, commerce and industry, under the recent wise administration of the patriotic Intendant Talon, were flourishing, and to the fur trade, lumber and fishing export, were added grist mills, tanneries, etc., for home manufacture of the necessities of life. The Hôtel Dieu de Québec, founded by the Augustinian nuns in 1639, had become in 1690 a well-organized hospital of some fifty beds, containing a ward for men and another for women, with a place reserved for the care of sick officers and a Hôpital Général, caring especially for the mentally afflicted, had also been opened. Among the practitioners who had come as "medical colonists," or from an interest in the fur trade or other reasons, are mentioned especially at this time Duchesne, a surgeon whose name is attached to medico-legal reports of the time, and who became proprietor of the later Plains of Abraham; Giffard, first physician to

the Hôtel Dieu of Quebec, who received the Seignury of Beauport in acknowledgement of innumerable services, and who was the first Canadian habitant to receive letters patent of nobility; and Jean Madry the noted barber-surgeon, the first alderman of Quebec, who succeeded Giffard at the Hôtel Dieu, and first established the practice of surgery in the colony; and, as of some prestige also, Timothy Roussel and Beaudoin. "To these, *médecins colons*, and many others less in the limelight, came Michel Sarrazin to lend the strong hand of his fellowship and support. Like them, conscious of duties beyond the bounds of his profession, he mingled with the entire local life. More than any of these he was to shed lustre upon Canadian science at its dawn, and on the medicine of this time. But, with perhaps a wider horizon, he remains of the same race and type. A brave man who knows how to do hard labour, a pioneer such as France has always known how to supply to the entire universe, carrying everywhere his faith, his science and his initiative."

Of Sarrazin's actual professional activities during this early period of his life we know relatively little. His name occurs as surgeon attending several duels, and from his military appointment he was certainly active among the wounded during the siege of Quebec by Sir William Phipps in 1690. In 1693, also, he was appointed physician to the Hôtel Dieu by the Sisters, who held him in high esteem, and he undoubtedly practised his art, not only among the troops but throughout the colony, where under arduous conditions of travel he is said to have given gratuitous surgical aid within a radius of sixty leagues. On one of his visits to Montreal in the year 1692, he fell seriously ill and made a notarial will dated at the Hôtel Dieu and preserved in the City Archives, in which he bequeathed his surgical books to three local surgeons, the Sieurs St. Amand, La Source and La Sonde, who had evidently attended him. The bequest was revoked later in a second will made during a subsequent illness of his at Quebec.

But the most interesting document extant relating to him at this time is a "*Mémoire des Médicaments nécessaires pour les Troupes du Roy au Canada pour envoyer en 1693*," which is published here in the Appendix. It is, as Dr. Vallée remarks, a perfect example of the polypharmacy of the day, being headed by the Theriacum of the middle ages (said to contain over ninety ingredients and containing also a rich supply of essential oils, syrups, ointments, plasters, extracts and drugs of all kinds, including the much disputed antimony), as well as "2 dozen lancets for bleeding," syringes and cauteries for wounds, and other implements of the surgeon's armamentarium. Comparison of this list with that drawn up by Jackson the surgeon in charge of Phipp's forces is said to

have shown a very similar content in the English one.

Little or no evidence appears at this period of the profound interest in natural history and the scientific trend which were so prominent a feature of Sarrazin's later life. Two facts only are significant of this. His intimate friendship with Franquelin, the hydrographer of the Jesuit College, and the dissatisfaction which he felt at the inadequacy of his training as a barber surgeon, led him, after eight years' practice in this country, to resign his military office and return to France for the purpose of obtaining further medical training and a university degree. The surgeon Beaudou was appointed by Frontenac in charge of the troops in his place in 1693, and in 1694 Sarrazin sailed for France, to return to Canada three years later with the desired academic qualification, a trained scientist with connections established among the leaders in his field of research, and to become, in deed as well as in name, the foremost physician of New France and an important factor in her rapidly expanding national life.

II. MEDICINE IN THE SEVENTEENTH CENTURY SARRAZIN'S SOJOURN IN FRANCE (1694-1697)

There was apparently at this time some question of his entering the church, but his heart was evidently set upon his original vocation, and almost immediately after reaching Paris he seems to have entered upon his studies at the Ecole de Médecine, where he followed lectures at the amphitheatre Riolan, and received clinical instruction at the Hôtel Dieu de Paris. The degree of Doctor of Medicine, for which he had enrolled himself, called for a preliminary Master of Arts diploma, and a seven years' course of study, and that he was able to abridge these requirements within the three years of his stay in France is probably to be explained by the wide clinical experience which he had gained in practice in Canada. He presented himself in due course in 1697 for the Doctor's degree at the University of Rheims, from which some thirty years later his son also graduated.

It is difficult at the present day to realize the great distinction that existed in Europe and particularly in France at this time between the *physician* and the *surgeon*. The latter's work was not considered so much an *art* as a *trade* for which no long preparation was necessary, and this was usually acquired in the provinces. As already intimated, practically all the qualified practitioners in New France were of this type of barber-surgeons, and it is little wonder that a man of Sarrazin's intellect and humane feeling should have felt the urge for wider knowledge for his treatment of the sick. To understand the tremendous intellectual im-

petus which a university training in Paris at that time must have brought to this mature student, whose mind had been sharpened by hard won experience, one must recall the real status of medicine itself at this time. The seventeenth century was, as is known to us all, a classic age. It opened with Harvey's discovery of the circulation of the blood, which gave the impetus to other researches in physiology already bearing fruit; chemistry and physics were, under the guise of mistaken mechanistic theories, still in course of development, and the great anatomists, such as Morgagni and Malpighi, were opening the door to modern conceptions of the structural changes in disease; while at the same time the English clinician Sydenham, who died in 1689, had, by his power of observation and method of delineation of certain disease entities and their rational treatment, brought these new found principles to a focus in the birth of the great science of clinical medicine. The Ecole de Médecine was itself full of discussion and eager disputation of these new ideas that were trembling in the air. Moreover, this Paris, under Louis XIV, was actively fostering two other great scientific movements, allied to medicine and ministering indirectly to its advancement, both of which became to Michel Sarrazin an avenue and a source of inspiration for his future work. These were the *Jardin des Plantes*, and the *Académie Royale des Sciences*.

The *Jardin Royale* or *Jardin des Plantes* (which became after the Revolution the Museum of Natural History of Paris) was founded in the reign of Louis XIII by two "médecins du Roi" Herouard and Gui de la Brosse, and was not entirely unconnected with medical teaching, for in its deed of incorporation it was stated that since at the Ecole de Médecine the operations of pharmacy were not taught, it had been requested by the Sieur Bouvard that "three doctors chosen from the Faculty of Paris should be appointed to demonstrate to the students the interior of plants and all forms of medicines and to work on the composition of all kinds of drugs. . . ." How far this was carried out does not concern us, but under Louis XIV, Fagon, médecin du roi and director of the Jardin, a nephew of Gui de la Brosse and deeply interested in natural history, appointed from the province Joseph Pitton de Tournefort to be Professor of Botany at the Jardin. This de Tournefort, known as the great precursor of Linnaeus, is said to have founded the modern science of botany, and he it was who created the Museum of the Jardin, both from collections made in his own travels and from the fruits of the travels of others. Curiously enough, though a professor of botany, he was a fellow student in medicine of Sarrazin and sent in his thesis for the degree a year after the latter, in 1698,

and he became Sarrazin's earliest protector and his first link with the scientific world.

The Académie Royale des Sciences was the outcome in the middle of the seventeenth century of intimate reunions of the best minds of Paris, among whom are mentioned the Descartes and the Pascals. It was founded in 1666 by Colbert, but was reorganized and regularly constituted by Louis XIV in 1699. Here were assembled the great men of the period, represented in their respective fields by such names as Tournefort, Réaumur, de Fontenelle, Boerhaave, Roemer, Peter the Great, Mariotte, Malebranche, and Sir Isaac Newton. These and such as these were opening the way for the new thought and advances of to-day, and they went about their work of preparation for the centuries to come with a precision of which we are far too often ignorant. Above all, they sought to widen the field of knowledge by the utilization of all the sources of information accessible to them, both by sending forth their members to distant parts, and by entering into correspondence with carefully selected persons in foreign places, realizing that science has no country and that relations between research workers must be world wide in scope. Sarrazin was made such a corresponding member, selected by de Tournefort on March 4, 1699, at the same meeting at which Sir Isaac Newton was elected an "associé étranger."

III. RETURN TO CANADA. SARRAZIN AS PHYSICIAN-SURGEON IN NEW FRANCE (1697-1735)

Dr. Sarrazin's return to the colony after his three years' absence in Europe was probably hastened, rather against his will, by urgent appeals from the people and from the Intendant for the return of this man who "having acquired consummate knowledge of surgery during six or seven years in this country has gone to France to complete his perfecting in the study of medicine" (extract from letter from Champigny to the ministry dated November 6, 1695, soliciting his recall at a salary of 600 livres). It is quite clear from documents in the Quebec Archives that he came back with the definite intention of devoting at least a part of his time to the scientific interests he had developed in Paris and to utilize his distant location for the dissection of rare animals and researches into unknown plants, and not entirely to the treatment of the sick. That he contrived to carry out this resolution in full measure in the midst of an enormous and most engrossing practice was not the least remarkable feat of his crowded life. Even before his landing he was plunged into the vortex of professional responsibility and activity, for a serious epidemic of hæmorrhagic "purpura" (i.e., typhus fever) so common under the cold and dampness and the complete lack of sanitation and inadequate food

supply that prevailed on shipboard in those days, broke out on the vessel on which he sailed, and spread from it to the habitants of Quebec and to the Religieuses of the Hôtel Dieu, which was deluged with patients. Sarrazin threw himself into the necessities of the situation with complete devotion and with apparently extraordinary success, for practically all those affected on board were said to have recovered from a malady which twelve years before had carried off more than eight hundred victims! In the face of his already high reputation, the inevitable result was that he was besieged on all sides by individual patients and by requests for consultations from practitioners and curés, and in the year 1700 he was appointed by Royal mandate, and on a salaried basis, Médecin du Roi and Physician to all the Hospitals of New France, with a vast clientèle that stretched from Quebec and Three Rivers to Montreal, and *ex officio* chief medical attendant upon the Governor of the Colony, Monseigneur de Laval, de St. Valier, and all other notables.

In this same year 1700, another epidemic, this time of "la grippe," broke out, and was followed during the winter of 1702 by the terrible scourge of smallpox, which, starting from a house in which a passing Indian had died of the disease, spread like wildfire through the city, with such a multitude of fatalities that individual burial could not be carried out and fourteen to eighteen bodies were committed daily in a single grave, to the number of some two thousand. The same dread disease visited the city in 1703, and the "Mal de Siam" (yellow fever), which had appeared sporadically from time to time, assumed the proportions of an epidemic in 1709. Tuberculosis was apparently indigenous and so attracted the concern of Sarrazin that he sent a request to France, which was promptly granted, for asses to supply the milk then recommended for these patients. Added to these infections were those maladies dependent on the severe climatic conditions, rheumatism and lung diseases, and the scurvy still attended the poverty of diet that often prevailed.

In the domain of general medicine Sarrazin was no less successful than in these more specific fields. He cured M. de Callières, at least temporarily, of a dropsy, and his treatment of pleurisy by alternate diaphoresis and bleeding, which was written out by him in manuscript, was employed with success by M. de la Galissonnière (as recorded by Kalm), and is an excellent illustration of his therapeutic method. He used Glauber's salts in huge doses, and was officially employed by the ministry to investigate, with the apothecary of the Jesuits' College, the chemical composition of this salt. His botanical work again helped him to greatly enlarge his practical knowledge of local remedies, and he never fails to note in his description of

every plant which he gathered and studied, its pharmaceutical properties and the native uses to which it was put. The remarkable catalogue of two hundred living Canadian plants, presented by him to the Jardin des Plantes in 1704, reproduced in facsimile in the appendix of this book, abounds in such annotations. Some were noted to have diuretic properties; others were emetics or purgatives and, as in the case of the *Aster corona*, of use in epilepsy or convulsions; others, as the *Aralia canadense*, valuable for the treatment of anasarca; others were used by the Iroquois to neutralize snake bite; still another as an abortifacient. Throughout, however, he maintains his critical judgment, rejecting certain substances, as a certain bark for the cure of cancer, after due experimentation, as of unproved efficacy.

Nor did he in the exercise of his new profession lay aside the art of surgery which he had practised so successfully before his return to France. The annals of the Hôtel Dieu of Quebec contain many records of wounds dressed and operations performed by him in this later period of his life. Of these the most interesting is the account of his treatment of the Mother Superior of the Congregationists in Montreal, who suffered from an intractable cancer of the breast, the result it is said of the irritative action of penitential girdles, and who came to Quebec for operation by him about the year 1720. After treating the field of operation for some ten days, and partaking of the Holy Sacrament with his patient and the entire community of the Hôtel Dieu, he proceeded to the amputation of the diseased organ, with complete success, for the reverend patient made a good recovery and lived in the full discharge of her activities for nineteen years longer, dying at the age of seventy-nine. Another operation of the same sort was performed by him on another nun a few months later.

On Dr. Sarrazin's activities in medico-legal questions we have not space here to dwell. Such enquiries were carried out regularly and efficiently, in small as well as large matters, under the Criminal Act of Louis XIV, and he was often called upon to officiate, as in an enquiry instituted on October 23, 1702 upon the cadaver of one La Chaume, assassinated.

Among the fellow practitioners who flourished in New France during this later period of Dr. Sarrazin's life are mentioned especially Berthier, who was also a salaried *médecin du roi* and assisted him in his attendance on the Governor, and was a surgeon at the Hôtel Dieu until 1725. Timothy Roussel, physician to the Hôtel Dieu, whose offices were in the rue de la Buade, where he built the famous house of the Chien d'Or; Benoit, surgeon to the hospital at Montreal, with his son, born in the country, and educated only by local studies; and the Soupierans who

practised at Quebec through three generations with no other knowledge than what had passed from father to son. In a class by themselves were the Frères Boispineau, apothecaries at the Jesuit College, who openly practised medicine for many years with much success. Madeleine Bouchette, a trained midwife, who came out on salary from the king in 1722, represented another group, as did David and Gaschet, apprentices of Timothy Roussel. Among the most famous of the actual charlatans of the day were Marguerite Désy of Three Rivers, as celebrated for her cures as for her scandalous conduct; Phlem, who came out as a healer from France; and François Paris dit La Magdaleine and his wife. Considerable protest was made against this unchecked liberty of practice before the Act of 1788. Thus Lajus, physician to the Hôpital Général in 1712 petitioned the Conseil to limit the number of surgeons in Quebec to four, and to impose a fine of two hundred livres, with confiscation of all his drugs and instruments, on any surgeon from abroad setting up practice there; and Timothy Sylvain (Sullivan), of Irish extraction, was required by Governor de Beauharnois to pass an examination on his medical knowledge before Dr. Sarrazin, the only person in the country competent to judge of his fitness.

IV and V. A MEMBER OF THE ACADEMIE ROYALE DES SCIENCES. SARRAZIN AS BOTANIST AND BIOLOGIST

At one of the first meetings of the Academy after its reorganization early in 1699, "all the Academicians present named different persons with whom they would be in correspondence on their respective sciences, either in the provinces or in foreign countries," and de Tournefort at this time designated Dr. Sarrazin to be his Corresponding Member. He remained in this relation until de Tournefort's death in 1707, and made most of his botanical communications, as well as his donations to the Jardin des Plantes, through the latter. Later, he presented them through the Abbé Bignon, until in 1717 he was again selected by the great scientist Réaumur to be his Correspondent, and from then on date most of his remarkable contributions on the anatomy and physiology of the native Canadian animals.

Sarrazin was thus only one of a large group of research workers scattered throughout the Antipodes, whose powers were being taxed along the same lines, and both missionaries and explorers had faithfully endeavoured to describe, and as far as possible classify, the new forms of plants and animal life. Considerably before his time too, both beaver and muskrat and their habits had been portrayed. Thus Dierreville had published at Paris in 1635 a *Canadensium plantarum*

historia, and Pierre Boucher, Governor of Three Rivers in 1665, wrote a *Histoire naturelle de la Nouvelle France, vulgairement dit Canada*, while an eighteenth century book bears the title *Traité des animaux à quatre pattes terrestres et amphibies qui se trouvent dans les Indes Occidentales*, followed by a *Traité des oyseaux*, and a *Traité des poissons*. It is, however, very interesting to note, writes Dr. Vallée, that he stands in the forefront of these workers by virtue of his methods, both of observation and approach, which are those of modern biology. "An incomparable anatomist, whose descriptions were not to be surpassed, he pushes this study to the finer structure of the tissues and organs, to a point that might be controlled without fear of error by the microscope. A physiologist in embryo, he does not stop at the gross findings of the great animal functions but dives without hesitation into the most complex mechanisms that form the field of biological researches to-day. Employing hypothesis with discretion, he insists upon an absolute control of all his observations, and confirms by repeated examination of the same object under varying conditions the findings which he believed he had made in his first research. . . . "Moreover he had the passion of the research worker revealed in all his correspondence and all his intimacies, in his initiative and his power of overcoming difficulties and associating others with him for purposes of verifying and controlling his original findings. In all these ways he revealed himself a consummate man of science."

His actual scientific contributions can be only briefly enumerated here. In botany there stands first of all his great contribution to the Jardin Royale of living specimens of practically all the Canadian flora, which remained alive there ten years after their donation, with a descriptive catalogue which is reproduced in facsimile in the Appendix. It is said that he himself transplanted and watched over each of these plants as he studied them, and forwarded descriptive memoranda upon them with written instructions as to their care and directions to collect the seed and return it to him.

Of his original descriptions of plants not previously known, the most important treats of the "Pitcher Plant," which grows throughout America and was called by Tournefort after him the *Sarracena purpurea*, its botanical name to-day. His description of it is given with the same luxury of detail that characterizes his contributions on animal anatomy. It is published in full here and should be read.

A later botanical contribution of his that touches on a subject of national importance is that published in 1730 in the *Mémoires de l'Académie* on the "Sugar Maple." He describes four varieties in the country, notably

"*l'Acer canadense sacchariferum fructu minori*," and states that the French, following the Indians, know the sugary character of its sap in springtime, the climatic conditions favourable for a good running (snow, thaw, frost), and how much sugar a tree three or four feet round will give in a season. Competent authorities give him the credit, if not for the discovery, at least for the industrialization, of maple sugar. A specimen of the sugar maple was included in his large donation of plants to the Jardin in 1704. The "Blueberry" is another common Canadian fruit which Sarrazin made known in France.

An outcome of his insight into plant life, significant of his truly extraordinary sagacity and foresight in the application of natural laws, is a fact told us elsewhere in this book (page 146-146), when dealing with his activities for the civic welfare. As a member of the Conseil Supérieur he had been asked to look into the question of harvesting and sowing grain, a vital question then, as now, in a country with short seasons, and Dr. Vallée quotes from Kalm that "Dr. Sarrazin had procured in Sweden a small quantity of winter wheat and barley. This was sown (by him) in autumn, passed the winter without damage, and produced fine wheat the following summer, with grains a little smaller than the wheat of Canada. . . . "but this winter grain gave a larger amount of fine flour than the summer wheat. *I have never been able to understand (wrote Kalm) why this experience was not continued.*" In view of the modern transformation in the harvest acreage of Canada through the introduction of wheat adapted to a short summer, this practical application at that date of Sarrazin's scientific intelligence is truly astounding.

Sarrazin's first personal observations on the beaver appeared in the Transactions of the Académie Royale for 1704, (through de Tournefort) and reports a minute dissection of an animal weighing fifty pounds. As a model of his fine anatomical style his classic description of the muscles of the back and of their fasciae and aponeuroses is given verbatim, and is so clear that, as his biographer says, one can reconstruct from it the whole lateral wall. From the functional standpoint his greatest interest centres upon the formation and minute structure of the generative organs; and here he made the curious discovery of a single cloaca, making the distinction of the sexes in the beaver difficult. His most masterly exposition, however, is given of the digestive tract and its linings, and he describes also the false ribs possessed by this animal. Twenty-eight years later he returned to this subject and sought other beavers for dissection, to confirm and extend his earliest observations.

Sarrazin's masterpiece in zoology was how-

ever presented in 1725 through Réaumur, and is entitled "An extract of Various Memoirs of Monsieur Sarrazin on the Muskrat." It is illustrated by sixteen different figures made by himself (failing another draughtsman). The description of the stomach and the changes that take place in it during digestion and on summer and winter diet is a classic, and in view of his limitation to a "loupe," or some elementary form of microscope, is a real *tour de force*. He described also the carcajou, the "vache marine," "loup-marin," and in great detail the porcupine, describing in the latter animal seven different kinds of skin and discussing at great length the question as to whether it throws its spines when attacked; as usual he delays upon the subject of the genitalia in which he finds a number of small peculiarities. He even attempted to dissect a skunk, but gave it up "because it had a dreadful smell, capable of making a whole canton desert,"

VI. SARRAZIN IN SOCIAL AND POLITICAL LIFE

VII. AN INTELLECTUAL IN BUSINESS

VIII. THE DESCENDANTS OF MICHEL SARRAZIN

IX. SUCCESSORS OF SARRAZIN

It need scarcely be told that Dr. Sarrazin was essentially a worker, and found little time for relaxation, unless his scientific avocations could be so described. In political matters he was always active, having been elected to the Conseil in 1707, and he was honoured by being appointed Keeper of the Seals in 1733. He did not marry until his fiftieth year, but made a fortunate union then with the young Marie-Anne Hazeur, a lady of good family and position, whose father had owned large properties in the region of Gaspé, and was also Seigneur of Malbaie (Murray Bay). He himself, though apparently of little or no means on his arrival in the country, had become at this time a large proprietor. The remuneration of a "Médecin du roi" was not high, but due to repeated representations on his behalf by the Governors of the colony and others of his friends high in office at Quebec, his salary, which began in 1699 at 300 livres, was raised in 1702 to 600, in 1703 to 800, in 1709 to 1,100 livres, and in 1717, when his petition for an annuity of 400 livres for his son to study medicine in France was granted, it rose to the very considerable sum of 2,000 livres per annum. Desirous of obtaining for his growing family a worthy patrimony, he invested in what should have become extremely valuable land, namely, the fief of St. Jean, an area of six acres, comprising about a quarter of that occupied by the present city of Quebec, and running from the river St. Charles to the Grande Allée, as well as the fiefs St. François and Ste. Genevieve (with manor house attached and many buildings), for the sum total of 7,400 francs by deed of sale dated October 22, 1709. He had

also a house on the rue St. Louis and another on the rue Parloir. Through his wife he came into possession of other still more extensive properties in Gaspé, the fief de la Grande Vallée des Monts Notre Dame and the adjoining concession of l'Anse de l'Etang (from which he took the title by which he is known), and a part of the Seignory of Murray Bay. The possession of these combined seigneuries in his own right and that of his wife created him a Grand Seigneur, as is shown by the act of "*foye et hommage*" dated at Quebec July 10, 1726.

But misfortune overtook him in his last years. His house in the rue St. Louis was burnt, depriving him of a rental of 600 livres a year; there was a fall in the paper money of the time, and, worst of all, the failure of slate quarries which had been discovered on his Gaspé property, and in the operation of which he had become heavily involved, reduced him and his family to actual poverty. He died of a malignant contagious fever brought from a ship and caught by him from patients in the Hôtel Dieu of Montreal, where he died after two days of illness on the 6th of September, 1734, in his seventy-fifth year. He was buried without ceremony or éclat in the cemetery of the poor! He was survived by his widow and five children. Of the latter, two only lived to have descendants, Claude Michel Sarrazin de l'Etang, who returned to France, and whose name died in his female succession of the next generation; and Charlotte Angelique, who married Jean Hippolyte Gauthier de Varennes and founded an important French family that survives through several branches in the Province of Quebec to-day. His humble ending did not prevent the public from acclaiming on all sides his goodness and charity and knowledge. His best epitaph was inscribed by the Religieuses of the Hôtel Dieu of Quebec in their register at the time and reads:

"For more than forty-five years he exercised his art in this country with rare charity, perfect disinterestedness, extraordinary success, surprising address, and an unparalleled devotion for every kind of person, which rendered him able to perform with joy and grace all that lay in his power for the relief of the sick under his care."

The last chapter of this volume visions the future of French Canadian medicine under the title "Les Successeurs de Sarrazin." Space does not permit us to enter upon this topic, nor have we been able to dwell adequately upon the interesting subject of Dr. Sarrazin's social and political relations. But the book is there to be read, and enough has been said here to show not only what manner of man this was whom we must acclaim as the pioneer of scientific medicine in this country, but also that Dr. Vallée's exposition is a solid contribution to the history of medicine on this continent of which the Canadian profession must be most justly proud.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

The last few years have seen a marked development in the hospital arrangements pertaining throughout Scotland. Every part of the country has its own peculiar problems to face. Until recently the voluntary hospitals in the larger cities had difficulty in dealing with the long waiting lists of patients, while in the more rural parts of the country attempts have been made to treat patients on the spot by the creation of a local hospital service. A great deal of interest has been aroused in the question of medical service, and although we hear on every hand, gloomy prognostications that the voluntary hospital system is doomed, evidence appears to be forthcoming that this is not the case. At present the voluntary hospitals in Scotland provide 9,000 out of 25,000 hospital beds. Heroic efforts have been made to raise funds in many places by means of flag days, hospital days, pageants and processions.

Eighteen months ago the city of Aberdeen set out to collect the sum of £400,000 for the erection of a new hospital. Towards that amount, the sum of £341,000 has already been raised, by the freewill offerings of the people of this reputedly parsimonious city. The present Infirmary is an old institution with a history that goes back two hundred years. Although it has steadily moved forward in an endeavour to keep pace with the growth of population and in keeping with modern medical requirements, it is now felt that it is no longer adequate to meet the needs of the times. Its environment in a noisy, busy part of the city is not satisfactory, and the new hospital is to be situated in more peaceful surroundings at Forehill. This new institution is to be merely part of a large scheme comprising the other Aberdeen hospitals—the present Royal Infirmary and Old Mill Hospital. This project was the dream of Emeritus Professor Matthew Hay, the famous medical officer of the city, and has the ultimate object of concentrating the medical services of the city on the new site. The foundation stone of the new hospital was laid on August 29th by the Prince of Wales, who was accompanied by his brother the Duke of Gloucester.

The people of Stirling have also gone outside their city in search of quiet and fresh air. The new Stirling Royal Infirmary, which was opened by the Duke and Duchess of York on the 10th of August, is situated south-west of the town, no great distance from the historic field of Bannockburn. The building contains four surgical, two medical wards, and a children's ward. It also contains a maternity block, accommodating

twenty patients. Unusually large balconies have been provided at the ends of the wards so that the patients can be wheeled outside in their beds. When finally completed, Stirling will have one of the most up-to-date hospitals in the kingdom.

Dunfermline, the burial place of King Robert the Bruce, and Malcolm Canmore's seat of government, has just completed a considerable addition to its present hospital. This institution has for years played a most useful part in the economic life of west Fife. This is a thickly populated neighbourhood and one of the leading coal fields of Scotland. Accidents, injuries, and occupational disorders are frequent, and the Dunfermline Hospital has long enjoyed a high reputation.

In Edinburgh, after fourteen years occupation as a military and pensions hospital, Craigleith Hospital is about to revert to its former use as a Poor Law Hospital. This will mean the addition of some six hundred beds to the requirements of the city. These are badly needed as the two present Poor Law hospitals at Craiglockhart and Seafield are much overcrowded.

In addition a new hospital is to be opened on the south side of Edinburgh for the treatment of crippled children. This new institution is to function with cottage hospitals in the outlying districts and will be the central point of a service linking up the orthopaedic treatment in the south east of Scotland. It is expected that this scheme will form an example which will be adopted in other parts of the country.

At the same time, the directors of the National Institution for mental defectives, at Larbert, Stirlingshire, are eliciting public support for an industrial colony scheme. This institution is the only national voluntary organization in Scotland for mental defectives and has been in existence for sixty-eight years, providing a home and training for more than five hundred defectives under twenty-one years of age. The directors wish to provide for defectives over twenty-one years, and with this in view have purchased Larbert House and estate, where it is proposed to establish a farm colony.

A branch of the Scottish National Institution for Blinded Sailors and Soldiers has just been opened in Glasgow. The headquarters of this institution is Newington House, Edinburgh, where it will remain. The new branch in Glasgow will provide accommodation for nineteen men. These men will receive instruction in boot-repairing, basket, brush and mat making, poultry farming, and pig breeding. At the conclusion of their training they will be settled in various places throughout the country. Positions have already been provided for one hundred and

forty men in different spheres, and most of them have done well.

The more populous parts of the country have not been the only places to put their hospitals in order. At Inverness, the capital of the Highlands, the Northern Infirmary is being enlarged and reconstructed. The scheme is to cost £100,000, of which more than £74,000 have already been voluntarily subscribed. A handsome donation to the funds of the scheme was received from Mr. Alexander Edward of Forres, who has gifted to the Northern Infirmary the estate of Kintail, one of the best sporting properties in the Western Highlands. The value of this new possession is between £40,000 and £50,000, with an annual rental of £3,000. It has been suggested that, when the improvements are completed, a scheme of co-operation should be instituted between this Infirmary and the smaller local hospitals at Dingwall and at Fort William in distant Lochaber.

During the month of August a surgical specialist was appointed to the Orkney Islands, under the Scottish Board of Health, Highlands and Islands scheme. He will reside at Kirkwall, where he will be in charge of the surgical work at the Balfour Hospital, and his services will be available for consultation through the Islands. The appointment of a surgical specialist to the Orkney Islands, which was foreshadowed in this letter last January, puts the Orcadian Archipelago on an equal footing with the Island of Lewis and the Shetland Isles, where similar arrangement have been in force for some years, and have been most successful.

The following extract from an Aberdeen daily paper shows that the invasion of England has not yet been accomplished, though it appears to be progressing satisfactorily: "Dr. James Stirling Anderson, an assistant to the medical officer at Manchester, and a graduate of Aberdeen University, has been appointed medical superintendent of Seacroft Hospitals, Leeds. The short list from which the appointment was made by Leeds City Council formed the subject of a protest by a councillor against the alleged invasion of Leeds of so many Scots people. Alderman A. Masser deplored the fact that a Leeds man, who had acted as assistant superintendent of the hospitals for seven years, had not been appointed, and complained that of the short list of four, three were from Scotland. He added: 'There has been an unfortunate tendency in this council in recent years to scour Scotland whenever any person is required for any important post. I am told that if you go to the Health Department of Leeds as an Englishman you cannot understand what they are talking about. They are all Scottish. I suggest that we scrap our escutcheon altogether. Why not adopt the

thistle and the kilt, and have as our motto, Scotland for ever!—Nobody but Scotsmen need apply!'"

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The London Letter

(From our own correspondent)

It is of significance that the bulk of the annual report for 1927 of the Medical Officer of Health for the County of London is concerned with the School Medical Service, for it is gradually being realized that healthy children mean healthy adults, and where there are over four-and-a-half million people in one health district, as there are in the London County Council area, success attends attention to details. For example, the teeth of the London child have improved very remarkably during the last twenty years. In 1906 a dental inspection of a group of children at a certain school in London was carried out, and in 1927 at the same school a similar examination was made of children in the same sex and age groups as in 1906. The improvement is shown by a decrease in carious teeth from an average of 7.4 per child in 1906 to 2.1 in 1927. It was also found that 21.5 per cent of the children were quite free from any dental or oral disease in 1927, and in 1906 not one was thus clear, while the number of cases with enlarged submaxillary glands had fallen from 218 to 65. This result is achieved by a school dental service which treats 125,000 children yearly. More recent developments of "detailed" work for the London child are shown in a diphtheria-carriers' clinic established at Guy's Hospital in 1926 with great success, and a special unit for dealing with post-encephalitic patients under the age of sixteen which has fully justified the experiment although, of course, positive curative results are not expected. Another example of attention to detail is shown by a controversy over desks in the schools. Footrests were discarded many years ago, but recently certain head teachers advanced specious arguments in their favour. A medical officer of the school service investigated the subject and reported that the arguments were "either erroneous or unsubstantial," so foot rests were not introduced!

As has frequently been mentioned before in these letters the hospital system in this country is in a curious state and a good exercise in explaining the impossible awaits anyone who tries to expound our methods to a foreign visitor. One result of the present situation is that since very few hospitals are strictly "voluntary", and in many institutions patients are asked to pay according to their means, those just above the "hospital class" (a horrid phrase!) are demanding to be allowed to pay for the privilege of getting much better attention than they can

possibly get in their homes. The "King Edward's Fund," which controls much of the money allotted to hospitals, has recently published the findings of its committee on the provision of pay beds in the voluntary hospitals. It is estimated that about 7,000 beds are needed in London and about 1,000 are at present provided. Many hospitals are adding "private wards," but so often there is difficulty over charters and funds left for charitable purposes that separate endowment is often required. When the private patient is admitted there is at once the demand for the practitioner concerned with the ease to be allowed to attend, and very frequently there is a lot of squabbling over fees, while it is rightly urged that until the full cost of a pay bed in a voluntary hospital has been met there should be no fee for attending consultants. It will be seen that the problem is not an easy one, and it cannot be said that the latest report offers a complete practical solution, although it has very satisfactorily ventilated most of the difficulties.

Medical men in London have recently had sent to them a small pamphlet entitled "A Garden of Rest" in which some account is given of the

well-known crematorium at Golders Green, and the very beautiful details there set out suggest that some move ought to be made to get rid of many of the disabilities which militate against cremation in this country at the present time. It is extremely difficult and very expensive for the poor to obtain cremation and the existing legal requirements are very stringent. It is reported that the Home Secretary is revising the statutory rules and orders made under the Cremation Act and this, combined with some support of cremation by the public health authorities, may lead to an extension of the practice to the poorer classes. Most of the old village churchyards are now full, and new cemeteries are being opened, at very heavy cost, all over the country. Better, it is suggested, that the money thus expended be used for establishing a crematorium in each community and let the urns be interred in the church yards. There were only just over 3,000 cremations in this country in 1927 as compared with over forty-five thousand in Germany in the same period, so that there is considerable room for extension here.

ALAN MONCRIEFF

London, October 8, 1928.

Letters to the Editor

USE OF SULPHO-CYANATE OF SODIUM IN HIGH BLOOD PRESSURE

Dear Sir:

Dr. A. G. Smith and I gave a paper at the last meeting of the Canadian Medical Association on the "Use of Sulpho-Cyanate of Sodium in High Blood Pressure," which appeared in the September issue of your *Journal*. The subject seems to have aroused unusual interest and I have had many communications in regard to it from physicians in different parts of the country. This is satisfactory but unfortunately in several instances our suggestions regarding dosage have not been followed, with regrettable results, and this letter is in the form of a warning lest a drug which promises well should get a bad name from improper use.

Dr. J. B. Nichols of Washington, whose paper in the *American Journal of the Medical Sciences* (November, 1925) aroused our interest in the agent, recommended a dose of 15 grains a day. In our research we commenced with this amount but soon found that it was better to use smaller ones, and in our paper we recommended $2\frac{1}{2}$ grains twice or thrice daily. Even with 15 grains daily we got no untoward results except occasional nausea, but the smaller dose reduced the blood pressure equally well (although more gradually), and hence in our later work we gave

only $7\frac{1}{2}$ or even 5 grs. in the twenty-four hours and this is the dose that we recommended.

But certain doctors have far exceeded even Nichols' dosage and write to me asking if possibly the resulting symptoms could be due to the drug. "The answer has been in the affirmative" as they say in the Legislature. I give a couple of typical examples:—

(1) A medical man from the east writes that having heard our paper at Charlottetown he treated a patient as follows: "I gave her a few doses of 5 grains each, and one dose of 15 grains after the evening meal. The doses were given after meals three times daily. The symptoms following the evening dose of 15 grs. have been rather alarming,—vomiting all night, and next morning jaundiced. Twitchings of the muscles and attacks of rapid heart. Blood pressure 172/120. (It was 240/140 before). Next day it was 208/140; twitchings less pronounced and jaundice clearing up, but heart keeps pounding and rapid. Of course no further doses of the drug have been given. . . . I would be glad to know if a further use of the drug would be advisable."

(2) A doctor telephoned over the long distance to say that he had a patient with a blood pressure of 240/140 to whom he had given a number of 10 grain doses of sodium sulphocyanate every three hours. She was now

drowsy and in a stupor and would like to know if this was due to the drug.

Now most valuable medicinal agents which are harmless in medicinal doses are toxic in massive ones and sodium sulpho-cyanate is no exception.

I hope that this letter may appear in an early number of the *Journal*, as we feel a certain indirect responsibility and fear that if this drug is misused it may do much harm.

To repeat, the dose of sodium sulpho-cyanate, in our opinion, should be five to seven and a half grains in the twenty-four hours, and in this amount it is free from risk and often is valuable in reducing blood pressure, when such reduction is indicated.

I am, Sir, Yours faithfully,

R. D. RUDOLF

Toronto, September 29, 1928.

AN UNUSUAL TYPE OF SUPERNUMERARY DIGIT

Dear Sir:

In looking through the September number of the *Canadian Medical Association Journal* I came across an article by Dr. Corrigan of Lampman, Sask., describing "An Unusual Type of Supernumerary Digit," the said article displaying a photograph of a rudimentary sixth finger attached by a pedicle to the little finger of a baby's hand. I was struck by the photograph and would like to tell you about a case that came under my notice on Sunday, September 30th. On that date I confined a patient, a young French Canadian woman. It was her sixth pregnancy. When the baby was born, a girl weighing eight pounds, I was surprised to see attached to each little finger by a pedicle a tiny supernumerary digit, the exact counterpart of the photo given by Dr. Corrigan in his article. To make matters more interesting, the mother told me that out of her six children five had had little extra fingers, very similar to the baby born on Sunday, September 30th. She told me that the only child without the extra fingers was the one I brought into the world about thirteen months ago. This morning I ligated the pedicle with a silk suture and snipped off the little digits. One ligature slipped and there was quite a little bleeding until I applied another.

I enquired whether any other members of the family, either on her side or on her husband's had ever shown this tendency to have more than the normal number of fingers. She told me that one of her brothers had a webbed toe, but no other member of the family ever showed this abnormality except her own children. I am prompted to write you for two reasons (1) because of my seeing to-night by chance Dr.

Corrigan's photograph of his case, which is an exact picture of my own; and (2) because I thought it most unusual to find five children out of a family of six with extra digits.

Yours truly,

A. R. BAYNE

La Tuque, Que., October 2, 1928.

AUTOMOBILE ACCIDENTS AND THE HOSPITALS

Dear Sir:

The increasing number of automobiles on the roads of this country has provided a series of problems many of which are still unsolved.

To the medical profession the victims of automobile accidents provide a problem of great importance and this problem is shared by the hospitals. The hospital receives what is left of the human wreckage after a motor disaster, and the staff is expected to provide immediate skilful treatment for which they are infrequently paid. It is this expense item which is proving such a burden on our hospitals.

At the time of the accident it is impossible for the institution to refuse admission to the sufferer, and this fact is taken advantage of by the persons involved in the smash. Once the injured patient is dumped on the hospital the squabble as to responsibility begins. This controversy is frequently long drawn out and the settlement indefinitely postponed. In the meantime the hospital is unpaid. Again, it happens that a claims' agent will arrange a settlement by agreement, without including the hospital in such settlement. A great many of the pedestrians injured by motor cars are poor and unable to afford the litigation which is often so necessary to obtain compensation. Their poverty is also a barrier to successful collection of a hospital bill from themselves.

In recent years a large group of tourists travel long distances in cars of little or no value. When such a gypsy tourist is involved in a smash the victims are a charge on the nearest general hospital, and there is practically no chance of collecting hospital charges, for the tourist is a stranger, his car is cheap and damaged and is frequently deserted after a smash.

All of these circumstances make it apparent that an unnecessary burden is placed on the general hospitals, which burden is increasing with the increasing number of motor vehicles.

It is very likely that legally a motor vehicle could not be classified as a lethal weapon, but where a pedestrian is the victim of an automobile assault one may presuppose that the pedestrian did not run into the motor. Thus in the larger number of cases the motorist should at once be held responsible for necessary hospital

bills of his victim. In the case of injury of any individual where two motor cars are involved it should be laid down that no settlement should be completed before receipted hospital bills are produced. The details of this problem would necessitate the provision of suitable legislation and the co-operation of hospitals, insurance companies, and motorists' associations.

At present the hospital expenses of automobile accident cases is largely a charge on the general hospital which is supported either by

charitable endowment or by public taxation, whereas it should be directly charged to the agent causing the injury.

There is an effort at present being made in Great Britain to provide legislation along this line and I feel that the problem is sufficiently acute to be of interest to your readers.

Yours truly,

A. STANLEY KIRKLAND

Saint John, N.B., October 13, 1928.

Provincial Association Notes

ANNUAL MEETING OF THE ALBERTA MEDICAL ASSOCIATION

The annual meeting of the Alberta Medical Association was held in Edmonton on September 18, 19 and 20, 1928. One hundred and ninety-six registered.

At 9.30 a.m. the business meeting commenced, with Dr. W. A. Scanlon, President, in the chair. The minutes of the last meeting were taken as read.

The report of the Executive Committee was read, showing the post-graduate work that had taken place in the province during the last year. On motion this was approved of.

On motion, it was decided to continue to celebrate Lister Day in a suitable manner.

A letter was read from the General Secretary of the Canadian Medical Association, stating that at the last Canadian Medical Association convention it was decided that the fees would be due and payable on October 1st instead of January 1st each year. On motion this action was concurred in by the Alberta Medical Association.

A letter from the General Secretary, stating that the Canadian Medical Association approved of having field secretaries, and legislative committees for the provincial associations was read and referred to the Council of the College of Physicians and Surgeons to deal with as they saw fit. The meeting then adjourned.

The scientific program commenced after the above adjournment.

During the convention His Honour Lt.-Gov. Egbert, M.D., delightfully entertained the delegates and their wives at a garden party on the lawn at government house.

The adjourned business meeting was held on the evening of September 19th.

In the absence of Dr. Emerson Smith, Mr. W. G. Hunt acted as secretary.

The report of the Committee on the question of the establishing of a Canadian College of Physicians and Surgeons was presented by Dr. J. S. McEachern, as follows:

"The Committee, consisting of Drs. J. S. McEachern, Fred. Campbell and L. C. Conn, appointed to report on the communication from Dr. F. N. G. Starr *re* A Canadian College of Physicians and Surgeons, has met and considered the question.

"Your Committee is unanimous in the opinion that the Alberta Medical Association should endorse the movement to establish such a College and give it its full support."

On motion of Drs. J. S. McEachern and L. J. Clarke it was resolved that the Report of the Special Committee, *re* the establishing of a Canadian College of Physicians and Surgeons, be adopted.

In the absence of Dr. G. M. Reid, the Treasurer, the Associate Secretary presented the Treasurer's report. The receipts were \$402.44 and the expenditure \$319.68, leaving a balance of \$82.76. This was received and adopted, on the understanding that it be audited and filed.

The next question on the agenda was that of the continuation of the post-graduate clinics, and it was unanimously agreed that we ask the Canadian Medical Association to continue the post-graduate clinics along the lines of the past few years.

It was moved by Dr. G. E. Learmonth, seconded by Dr. T. H. Whitelaw, and carried:—

"That this annual meeting of the Alberta Medical Association desires to place on record its appreciation and gratitude to the Canadian Medical Association for the post-graduate courses which have been put on in Alberta the last three years, also for its great assistance rendered at the annual conventions. The men sent to us have been of high standing and have rendered invaluable services to the profession in this province for which we are profoundly grateful."

Some discussion arose over the interesting information gathered by Dr. Heber Jamieson concerning the Alberta Medical Association, and printed on the banquet menu card.

It was moved by Dr. Walter Park, and seconded by Dr. I. R. Bell, and carried:

"That this association purchase sufficient copies of the menu card to send to all the members of the profession in Alberta, whose names do not appear on the register this year as attending the convention, and to all those who were present who apply for the same.

"Further the cost to be as stated, viz., 25 cents per copy."

The report of the nominating committee was presented by Dr. Keillor as follows: *Hon. President*, Dr. A. Gillespie, Edmonton; *Past President*, Dr. W. A. Scanlon, Edmonton; *President*, Dr. P. M. Campbell, Lethbridge; *First Vice-President*, Dr. R. Parsons, Red Deer; *Second Vice-President*, Dr. T. R. Ross, Drumheller; *Secretary*, Dr. H. A. Gibson, 216 6th Ave. West, Calgary; *Treasurer*, Dr. J. D. Robinson, Banff; *Executive Committee* for 1929-1930: Dr. R. R. Elder, Medicine Hat; Dr. W. T. Hynes, Lacombe; Dr. B. R. Mooney, Edmonton; Dr. R. R. Hughes, Calgary.

Representatives on the Council of the Canadian Medical Association in addition to President and Secretary: Dr. H. H. Hepburn, Edmonton; Dr. L. J. O'Brien, Grand Prairie; Dr. W. A. Lincoln, Calgary; Dr. F. A. Nordbye, Camrose; Dr. A. G. Scott, Bassano.

The report of the nominating committee be received and adopted.

The question was raised as to the appointment of representatives to the Council who later might be unable to attend, and after discussion it was moved by Dr. W. A. Lincoln, seconded by Dr. C. W. Hurlburt, and resolved: "That the President and Executive Committee ascertain who are able to attend the Council meetings of the Canadian Medical Association, and be herewith given power to appoint others to fill the vacancies caused by those who cannot be present."

On motion of Drs. Lincoln and Ross, it was resolved "That we appoint the present Editorial Committee to be the Committee for 1929, as follows: Drs. G. E. Learmonth, Chairman, H. C. Dixon, P. M. Campbell, Harold Orr, and T. H. Whitelaw."

The President, Dr. Scanlon, raised the question of the expenses of the Secretary to the Council Meetings of the Canadian Medical Association, stating that, according to a former resolution, it was decided that this Association would pay the expenses of the President or his authorized appointee, and fifty dollars towards the expenses of any or all other official representatives to the Canadian Medical Association. The Association decided to make no change in their former action.

It was stated, however, that the Council of the College of Physicians and Surgeons was willing to pay the expenses of the Secretary to attend the Council of the Canadian Medical Association, therefore it was moved by Dr.

Somerville, seconded by Dr. Edgar Allen, and carried "That we thank the College of Physicians and Surgeons for their offer and accept it, and further that the whole question be referred to the incoming Executive with power to act and to bring in a recommendation for the consideration of the next annual meeting."

It was decided that the time and place of meeting of the next convention be left with the new Executive Committee.

Dr. Routley was present part of the time and told the Association something of what was being contemplated in the matter of organization in the other provinces. The Maritime Provinces were considering the question of a full-time travelling secretary for their three provinces. Manitoba and Saskatchewan were also considering the question of a travelling secretary.

He stated that none of the other associations paid the expenses of their delegates to the Council of the Canadian Medical Association.

W. G. HUNT,
Acting Secretary

ANNUAL REPORT OF THE GENERAL SECRETARY OF THE PROVINCE OF QUEBEC MEDICAL ASSOCIATION FOR THE YEAR 1927-28.

A summary of the activities of the Association for the past year indicates that they were varied and numerous. After the Clinical Day held in Montreal last year, the President, Dr. Stevenson, held a meeting of the Executive Committee, to elaborate a plan of work and action for his term of office. Proud of the success of his predecessor, he continued in his steps and his first effort was to put in practice the advice that had been given to him.

At this first meeting of the Executive, a committee for the study of the Workmen's Compensation Act was established, and also committees on Illegal Practice, on the Recruiting of Members, and the formation of Medical Regional Societies. These three committees were well completed by the Post-Graduate Committee which had been functioning in a very efficient manner.

The Executive Committee took under its charges the recruiting of members and the formation of Medical Regional Societies, with the help of the Post-Graduate Committee. We now show an increase of more than 400 new members, which added to the 250 of last year, brings our membership up to a total of more than 650, which is more than 25 per cent of the medical profession that endorses the movement and the ideas of our Association.

By the articles published in the medical reviews of the Province of Quebec, and more par-

ticularly in the *Union Médicale du Canada*, in the *Bulletin Médical de Québec*, and in the *l'Action Médicale*, numerous demands for the formation of Medical Regional Societies were addressed to us. With the help of a certain number of doctors of the district of Montmagny, visited by the lecturers of the Post-Graduate Committee, the Société Médicale du comté de Montmagny was brought back to life, and with the help of the physicians of the counties of l'Islet and Bellechasse, the Société Médicale des comtés de Montmagny, Bellechasse et l'Islet was founded.

Dr. F. L. Dubé solicited our help to organize a District Medical Society, la Société Médicale du District No. 1, comprising the counties of Témiscouata, Kamouraska, Rimouski, Matane, Matapédia, Bonaventure, Gaspé and les Iles de la Madeleine, all counties corresponding to the counties of the district No. 1, of the College of Physicians and Surgeons of the Province of Quebec. We got in touch with the president of l'Association Médicale des comtés de Témiscouata et de Madawaska, and at the meeting of the doctors of that Society, at which were convened the doctors of District No. 1, the first District Medical Society was founded, amidst an enthusiasm which was most gratifying.

The doctors of the counties of Charlevoix and Saguenay, isolated one from the other, conceived the idea of reviving the local Medical Society, which had been more flourishing many years ago. Again with the help of the Post-Graduate Committee, which delegated lecturers in that region, the foundation of La Société Médicale des comtés de Charlevoix-Saguenay became a fact, and it promises to be one of the most active of the regional societies.

The Committee on the study of the Workmen's Compensation Act and the Committee on the Illegal Practice report progress. These two committees assisted and defended the interests of the profession at large before the Provincial Government, jointly with the representatives of our universities and of the College of Physicians and Surgeons, and also with the help of the medical members of the legislature, who worked hand-in-hand to have the interests of the profession passed before the interests of the parties, and endeavoured to protect certain rights of the medical men in connection with the new Workmen's Compensation Act. One result was that the government finally rejected the demand for establishing a school of chiropractics in Montreal.

The Post-Graduate Committee, which has already an existence of three years, is certainly the one which has the biggest amount of work.

To date, twenty-two clinical meetings were held throughout the province, and more than six hundred doctors were present at the meetings. These lectures are still functioning, but, the fiscal year of the committee terminating on September the 30th, it is impossible for us to present a complete report of these meetings.

The Association had its representatives at the annual meeting of the Canadian Medical Association at Charlottetown, and Drs. Stevenson, Bazin and Lynch defended the interests of our profession, in the Council of the Association. Among other matters, it was decided at that meeting, that to become a member of the Canadian Medical Association, it was sufficient for a doctor to be in good standing with his College of Physicians and Surgeons and to be a member of a Provincial or a National Association. For instance, a doctor in good standing with l'Association des Médecins de Langue Française de l'Amérique du Nord, and who for one reason or another does not belong to the Province of Quebec Medical Association, could apply to become a member of the Canadian Medical Association and such a qualification would be sufficient.

It was decided that the year of the Association would start January 1st. Consequently, the existing Executive Committee will continue to act until that date, and the new Executive Committee which will be elected very shortly will direct the Association from that date.

The next annual meeting will be held in June in Montreal, when the Canadian Medical Association will be our host.

Finally, the Executive Committee held five meetings, in which most of the members took part. Besides the ordinary questions which were presented, the agenda contained numerous articles for the preparation of the Annual Clinical Day in which we obtained a very great success. We cannot but laud the great effort which the local committee on arrangements exerted in preparation for this annual meeting, and particularly the work of the local Secretary, Dr. Cabana, who devoted his time and energy to bring this meeting to a complete success, of which not only the doctors of the City of Sherbrooke, but the entire population might be proud. In terminating this report, may I be allowed to thank, in the name of all the members of the Province of Quebec Medical Association, the local committee on arrangements, and especially the Secretary, who is always the working head, to all of whom the the success of this annual Clinical Day is most entirely due.

LEON GÉRIN-LAJOTTE

Medical Societies

Xme CONGRÈS DE L'ASSOCIATION DES MÉDECINS DE LANGUE FRANÇAISE DE L'AMÉRIQUE DU NORD

This Congress was held in the City of Quebec from September 5th to 8th. An important delegation from France was present, consisting of Professor and Mme. C. Jeannin, Professor and Melle. Lereboullet, Dr. and Mme. P. Desfosses and Drs. Simon, Charpentier, and Leclerc.

The opening meeting, on Wednesday September 5th, was presided over by Dr. P. C. Dagneau, Professor of Anatomy in Laval University, and he was supported on the platform by the Hon. Athanase David, Provincial Secretary of Quebec, Mr. Oscar Anger, Mayor of Quebec, Mgr. Gosselin, Rector of Laval University, Dr. Arthur Rousseau, Dean of the Faculty of Medicine, and the French delegates. Some 425 physicians of the French tongue attended from various parts of Canada and the United States. Several felicitous addresses of welcome were delivered.

In the afternoon, Prof. Jeannin of Paris gave an address on "The treatment of puerperal infections after the method followed at the Obstetrical Clinic of the Pitié at Paris." His statements were based entirely on personal experience. At the Pitié, in 12,500 confinements there were 328 infected cases, a proportion of 2.3 per hundred. When one notes that the total mortality during the post-partum period is from 0.55 to 0.60 per cent and that puerperal infection alone accounts for one-quarter of these, the importance of the subject may be realized. The total mortality in puerperal septicæmia ranges from 12 to 66 per cent.

Professor Jeannin laid special emphasis on the plurality of puerperal infections. The conception of the condition as of single derivation has been productive of the worst therapeutical errors. On the contrary, for each form a specialized treatment is necessary.

He laid down the principal lines of treatment as follows:

In low grade infections local treatment in the form particularly of applications of lactic pap, (pansements à la bouillie lactique).

In case the uterus retains products of conception, it should be cleaned out. If it does not, reliance should be placed upon local tissue infiltrations, such as Besredka's method. The uterus should not be interfered with.

Infection of the broad ligaments calls for surgical intervention only if suppuration occurs.

When peritonitis supervenes laparotomy should be performed as quickly as possible. Professor Jeannin obtained four cures in seventeen cases operated upon.

When suppurative phlebitis occurs the focus may be isolated by ligation, or removed by

excision. However, interference should not be too hasty. The best results are obtained usually at about ten days after delivery.

In conclusion, the speaker stated that we were still comparatively helpless in handling these cases. The value of arsenobenzol and serotherapy was still to be established.

Professor Caouette, of Quebec, followed with a very full and well reasoned paper on "The usual causes and the prophylaxis of puerperal infections." In 237,199 births that took place in Canada from July 1st, 1925 to July 15th, 1926, there were 1,532 maternal deaths, or 6.4 per 1,000. Of these 1,532 deaths puerperal sepsis was the cause in 33 per cent. The best way to combat puerperal sepsis was for the obstetrician to maintain the same careful aseptic technique that was incumbent on the surgeon.

Dr. Dubé, of Notre Dame du Lac, discussed the subject as it appeared to the country practitioner.

Dr. L. Gérin-Lajoie, of Montreal, described the practice of the gynæcological clinic of the Notre Dame Hospital in regard to puerperal infection, as follows: (1) Light diet, (milk and vegetables); (2) Local treatment, as ice to abdomen, very hot vaginal douches, warm rectal irrigations; (3) General supporting treatment, as camphorated oil, brandy, good nourishment; (4) General treatment directed against infection, such as the use of propidon alternating with electrargol or septicemine. The total mortality of their cases, including many of the greatest severity, had not exceeded 25 per cent.

Professor Fortier, of Quebec, read a very carefully prepared study of puerperal endocarditis, and was followed by Dr. Vaillancourt on the "Ocular complications of puerperal infection."

The discussion on puerperal sepsis was continued the following day. Dr. Louis Phaneuf, of the Carney Hospital, Boston, stated that the American School advocated conservative, rather than radical, procedures. The vaginal examination was discontinued entirely in Boston.

Dr. Georges Labey, of Paris, discussed "Abscess of the uterus of puerperal origin." There were two forms, miliary abscesses and larger collections of pus occupying the whole thickness of the uterine muscle. Diagnosis is difficult in these cases. The principal symptom is pain in the uterus. The discovery of a swelling on the surface of the uterus is suggestive. Surgical intervention at once is indicated. Without it the prognosis is hopeless. He rejected the vaginal route. Well localized abscesses may be drained, but in most cases a total hysterectomy with Mikulicz drainage is required.

Dr. F. de Martigny spoke in favour of vaginal hysterectomy. He thought it was the most radical operation and produced the least shock.

In about 5 per cent of cases of puerperal infection it was necessary to interfere surgically.

Dr. Oscar Mercier described the pyelonephritides which sometimes, though rarely, followed delivery. It was not enough in cases of developing infection to examine the uterus, but the urine should be examined as well. Treatment at first should be medical. Only after this failed was ureteral catheterization indicated, to drain the kidneys.

Professors Brousseau, Caron, and Larue spoke on the mental syndromes associated with puerperal infection.

The following day was given up to the discussion of the important question of diphtheria.

Professor Lereboullet, of Paris, dealt very fully with the question of treatment and prophylaxis. During the attack anti-diphtheritic serotherapy should be instituted early and be intensive and prolonged. He referred to the ordinary antitoxic serum of Roux and the purified form put out by the Pasteur Institute; the latter was not followed by dangerous accidents. The purified serum was to be preferred in the ordinary and larval forms of angina, in asthmatics, in those who had previously been injected, and, generally, in adults. The ordinary serum (Roux) was, generally speaking, to be preferred in malignant diphtheria. It should be employed in massive doses, a minimum of 200 c.c. a day, repeated for four or five days. It should, of course, be discontinued if anaphylactic reactions occurred. He thought that local treatment in diphtheria was useless. As adjuncts to the treatment he advised adrenalin, strychnin, camphorated oil, and sometimes ouabain. Antispasmodics were also sometimes of value and warm compresses about the neck. He pointed out that immunization did not always follow an attack of diphtheria, and he thought it good practice to follow up the case, on convalescence, with three injections of anatoxin-Ramon at intervals of two or three weeks.

Dr. Lapierre, the Director of the School of Social Hygiene of Montreal, discoursed on the benefits of antidiphtheritic vaccination. Anatoxin-Ramon established an immunization in from six to eight weeks and was absolutely harmless. He thought the procedure should be carried out at the end of the first year of life.

Professor L. N. Fiset gave a complete review of the question of diphtheritic paralysis. According to certain American statistics it occurred in from 10 to 11 per cent.

The last day was given up to the discussion of various problems in psychiatry.

Besides the formal papers and discussions, clinical demonstrations were given in the various hospitals of Quebec.

It was passed unanimously by the Congress: (1) That only those children should be admitted to school who came provided with a certificate of anti-diphtheria vaccination.

(2) That anti-diphtheritic serum and vaccine

should be supplied to poor families by the municipal organizations.

The election of officers resulted as follows: President, Dr. P. L. Rhéaume, of Montreal; Vice-Presidents, Drs. Albert Paquet, of Quebec, L. E. Phaneuf, of Boston, and Dr. P. H. Laporte, of Edmundston; Secretary, Dr. D. Marion, of Montreal.

The next Congress will be held in Montreal in 1930.

ONTARIO MEDICAL ASSOCIATION

ANNUAL MEETING OF DISTRICT NUMBER TWO

District number two of the Ontario Medical Association met in annual session at the Norfolk Golf and Country Club, Simcoe, on Tuesday, September 25th, with an attendance of about seventy-five members.

At two o'clock in the afternoon the meeting was opened with a short business session at which Dr. A. J. McGanity, of Kitchener, was renominated Counsellor for the District, and Drs. W. A. McIntosh, of Simcoe, and F. J. Burrows, of Seaforth, were elected Vice-counsellors for the ensuing year.

A communication was received from the Oxford County Medical Society extending a very cordial invitation to the members of the District to hold the next annual meeting in that county.

Dr. Robert T. Noble, official representative of the College of Physicians and Surgeons of Ontario, then gave a review of the medical and narcotic drug acts, dealing with some difficulties which have arisen out of their attempted enforcement.

This was followed by a paper on "The thyroid subject" by Dr. J. K. McGregor of Hamilton; and a brief address by Dr. T. C. Routley, Secretary of the Ontario Medical Association, dealing with many matters of importance to members of the medical profession at the present time.

At four o'clock, the meeting adjourned in order that those present might have an opportunity of visiting the Norfolk Historical Museum and the grounds of Mr. H. J. Brook.

Dinner was served at 6:45 o'clock at the Norfolk Golf and Country Club, followed by short addresses by Dr. Weston Krupp of Woodstock, immediate past President of the Ontario Medical Association, and Dr. Ward Woolner, second Vice-president. The concluding address of the evening was given by Dr. Thos B. Fletcher, of Baltimore, on "Lesions of the pituitary gland and hypothalamic region, in relation to the etiology of diabetes insipidus."

A very enjoyable day was spent by all who availed themselves of the opportunity of attending this meeting. The cordial hospitality of the local committee and their wives left nothing to be desired, and the meeting was in every way a decided success.

ANNUAL MEETING OF DISTRICT NUMBER NINE

The annual meeting of the southern section of district number nine of the Ontario Medical Association was held in Sudbury on Thursday, September 6th, with an attendance of more than sixty. Dr. W. J. Cook, of Sudbury, presided and was renominated for the position of Counsellor, while Dr. A. S. McCaig of Sault Ste. Marie was elected Vice-counsellor for the southern section of the district.

At 9:30 a.m., Dr. F. F. Tisdall, of Toronto, gave a talk on "Deficiency diseases," followed by Dr. A. Primrose in an address on "Intestinal obstruction."

At 11:30 a.m., the meeting adjourned to the Grand Opera House where Dr. Canti's film on "Growth of tumour cells *in vitro*, and the effect of radium thereon" was shown, accompanied by an explanatory address by Dr. James Miller, Professor of Pathology, Queen's University, Kingston.

Luncheon was served at the Nickel Range Hotel, after which Dr. Roscoe Graham, of Toronto, gave an address on "Goitre". This was followed by a talk by Dr. Ross Millar, Ottawa, Director Medical Services, D.S.C.R., on medical problems relating to soldier's civil re-establishment.

Dr. Robert T. Noble of Toronto, who was present as the official representative of the College of Physicians and Surgeons of Ontario, then gave a brief review of the medical and narcotic drug acts, calling attention to some of the difficulties arising out of their attempted enforcement.

The dinner in the evening was followed by brief addresses by Dr. E. A. McQuade, Trenton, President of the Ontario Medical Association, Dr. A. Primrose, Chairman of Council of the Canadian Medical Association, and Dr. T. C. Routley, Secretary of the Ontario Medical Association. Dr. J. C. Meakins, of Montreal, then gave the final address of the evening, his subject being "Arterial hypertension, its significance and treatment."

One of the matters which was brought up for discussion at the brief business session was the care of drug-addicts, and a resolution was passed with the unanimous approval of the meeting memorializing the provincial government to provide adequate hospital accommodation for drug-addicts, and also to make provision for their committal thereto.

Following the afternoon program, the members and visitors enjoyed a round of golf. With excellent weather and unsurpassed hospitality on the part of the local committee and their wives, the meeting was one of the finest ever held in the district.

ANNUAL MEETING OF DISTRICT NUMBER TEN

The annual meeting of district number ten of the Ontario Medical Association was held in Fort William and Port Arthur on Saturday, September 8th, with an attendance of about forty.

The morning session, which was held at McKellar General Hospital, Fort William, was opened with an address by Dr. J. C. Meakins, of Montreal, on "Arterial hypertension, its significance and treatment." This was followed by a paper on "Common errors in the diagnosis of children's diseases," by Dr. F. F. Tisdall, Toronto.

At eleven o'clock, adjournment was made to the Royal Theatre, where Dr. Canti's film on "Growth of cells *in vitro*, and the effect of radium thereon" was shown, with an explanatory talk by Dr. James Miller, Professor of Pathology, Queen's University, Kingston.

After luncheon at the Kaministiquia Club, Dr. Roscoe Graham, of Toronto, gave an address on "Goitre", followed by a talk on "Intestinal obstruction" by Dr. A. Primrose.

Dr. Ross Millar, of the Department of Soldiers' Civil Re-establishment, Ottawa, then gave a brief talk on the work of his department, calling attention to a few of the medical problems with which they have to deal.

Dr. Robert T. Noble, official representative of the College of Physicians and Surgeons of Ontario, was present and reviewed the medical and narcotic drug acts, pointing out some of the difficulties which have arisen out of their attempted enforcement.

It was the unanimous opinion of those present that addresses such as those given by Dr. Millar and Dr. Noble were of distinct value to the members of the profession, not only as a means of gaining first-hand information, but of clearing up any misunderstanding which may exist.

In the evening, dinner was served at the Prince Arthur Hotel, Port Arthur, following which brief addresses were given by Dr. E. A. McQuade, President of the Ontario Medical Association, Dr. A. Primrose, Chairman of Council of the Canadian Medical Association, and Dr. T. C. Routley, Secretary of the Ontario Medical Association.

At the short business session which was held, Dr. J. C. Gillie, of Fort William, was renominated Counsellor for the district, and Dr. Chas. Powell of Port Arthur was elected Vice-counsellor.

The problem of the drug-addict was brought up for discussion and a resolution was unanimously agreed to, memorializing the provincial government to provide adequate hospital accommodation for drug-addicts, and also to make provision for their committal thereto.

While many very excellent annual meetings have been held in the district at the head of the lakes, it was the general feeling of the members that this one left nothing to be desired, either from the scientific or social point of view.

Topics of Current Interest

STANDARDIZATION OF THERAPEUTICAL PREPARATIONS

"The League of Nations has just published the report* of this year's meeting of the permanent Commission on the standardization of serums, serological reactions, and biological products. The problems dealt with by the Commission are highly technical, for the bio-assay of drugs involves methods in which every detail has to be regulated exactly if reliable results are to be obtained.

The work of the Commission is, however, of great service to the medical profession. In the first place it secures international agreement regarding the units of measurement to be used. This alone is a great advance, for medical literature is international, and the use in works of reference of units which differ in value in different countries may lead to dangerous confusion. In the second place it is most important to have really trustworthy methods for measuring the activity of biological products, and the Commission is doing valuable work by its careful and critical examination of the numerous methods of standardization that have been evolved.

The following is a summary of the more important conclusions arrived at by the Commission.

I.—STANDARDIZATION OF ANTIGENS AND ANTIBODIES

(1) *Anti-diphtheritic Serum*

'In view of new facts brought to light by the phenomenon of flocculation occurring in the mixture of specific toxin and anti-diphtheritic serum the Commission decided to study the evaluation of anti-diphtheritic serum and of diphtheritic antigen (toxin and derivatives) by the flocculation method.'

(3) *Anti-tetanus Serum*

The Commission now proposes to adopt the following anti-tetanic unit:

'The unit is to be determined with a standard serum in such a way that its relation to the American unit is exactly 2 International to 1 American unit.'

(4) *Anti-dysentery Serum (Shiga)*

The Commission proposes 'to adopt a standard serum prepared and distributed by the Danish State Serum Institute to establish the international antitoxic unit.'

'The serum is prepared for distribution in such a way that 1 unit is contained in 1/200 of 1 c.cm., and that a dilution in the proportion of 1:200 contains 1 unit in 1 c.cm.'

* Publications of the League of Nations. III, *Health*, 1928, iii, 6.

A test dose of a dysentery toxin shall be defined as such a quantity that, when 1 c.cm. of this serum dilution is mixed with it, the mixture shall cause death in one-third of the mice receiving it by intravenous injection.

When a toxin is standardized in this way it may be used in titrating the serums.'

(8) *Blood Groups*

The Commission:

'I. Learns with satisfaction that, on the initiative of the Health Organization of the League of Nations, the nomenclature proposed by von Dungern and Hirsfeld for the classification of blood groups has been generally adopted, and recommends that this nomenclature shall be adopted for international use, as follows:

O A B AB

To facilitate the change from the nomenclature hitherto employed the following is suggested:

Jansky	O(I)	A(II)	B(III)	AB(IV)
Moss	O(IV)	A(II)	B(III)	AB(I)

'II. Recommends the adoption of the following method of designating test-serums:

Test-serum A (anti-B)
Test-serum B (anti-A).'

II.—STANDARDIZATION OF THERAPEUTIC SUBSTANCES BY BIOLOGICAL METHODS

(1) *Salvarsan*

The Commission endorsed the recommendations at the Geneva Conference of 1925 with certain modifications. The chief alterations were that it was decided to recognize a test for experimental action on animals infected with spirochaetes as an alternative to that in which trypanosomes are used.

The Commission recommends that a 20 per cent excess of toxicity above that of the standard would be a suitable limit for tolerance. It also recommends 'that the standard samples for neosalvarsan and sulpharsphenamine provided by Professors Kolle and Voegtlin respectively for trial are suitable, as regards toxicity and experimental therapeutic activity, for adoption as the basis for the international standards.'

(2) *Digitalis*

No. 3. The Commission considered that they had now sufficient evidence before them to justify a somewhat wider recommendation with regard to comparative methods of testing than that adopted by the Geneva Conference of 1925. It considered that the following methods might be recommended as suitable:

'(a) The frog method in the form recommended by the Geneva Conference, or in its other modifications.

(b) The method using intravenous infusion in the mammal, as described by Hatscher and modified by Magnus and his colleagues for the cat, by Knaffl-Lenz for the guinea-pig, or by Tiffeneau for the dog.

(c) The Commission considered that the methods described by Mansfeld, using portions of the isolated sinus venosus of the frog, and by Trevan, using the isolated auricle of the rabbit, merited further investigation, with a view to consideration on a future occasion.

The Commission also recommended:

'That, when the dosage of digitalis or its preparations is expressed in units of activity, the unit employed for any preparation and in any country should be an international unit, which should be defined as the specific activity contained in 0.1 gram of the international standard powder.'

(4) *Insulin*

The Commission found that the results obtained by the use of the standard preparations recommended in 1925 'were uniformly favourable, and that the unit adopted and recommended by the Geneva Conference of 1925 was now in use all over the world as the only unit of insulin. In view of this satisfactory position the Commission decided to adopt the recommendations of the Geneva Conference of 1925 as regards the standard of insulin without modification. . . .

'That the dry preparation of insulin hydrochloride, prepared by the Medical Research Council of Great Britain, at the request of the Edinburgh Conference, should be accepted as the international standard preparation of insulin. That 1 milligram of this standard contains 8 units of insulin (or 1 unit = 0.125 milligram), as provisionally defined by the Insulin Committee of the University of Toronto.'

(5) *Pituitary Extract*

'The Commission accordingly recommends, in the light of the uniformly favourable experience obtained since the Geneva Conference of 1925, that the dry preparation of the acetone-extracted fresh posterior lobe substance of ox pituitary be now definitely adopted as the international standard preparation for the biological evaluation of preparations of the posterior lobe of the pituitary body, whether containing all the active principles of the lobe, or the pressor or oxytocic principle only, in separate solution.'

None of these conclusions requires much comment. In general it may be said that three years' experience in the use of the methods of standardization recommended at Geneva has shown that these are sound, and require only minor modifications.

It is interesting to note that as regards biological standardization experience has confirmed the finding of the Geneva Conference that the only sound method of standardization is to compare the activity of the preparation to be tested with

a standard preparation of the same substance. For example, preparations of digitalis and the pituitary gland have to be standardized against standard preparations of these drugs, and experience has shown that it is not safe to attempt to standardize them against simpler chemical substances of known composition. For example, the methods by which digitalis was standardized against ouabain, and pituitary extract against histamine, are now recognized as unsound."—(*Brit. M. J.*, 1928, ii, 3).

IRRADIATION AND THE BLOOD

"The enthusiasms that have been aroused by the demonstrable physiological potency of irradiation with ultraviolet rays generated in various ways call for restraint before they are permitted to promote therapeutic procedures that may presently be discovered to be ill advised. It is better that disappointments should precede rather than follow their use. Irradiation cannot be rationally employed until its possible effects on the organism are thoroughly investigated in many directions. The antirachitic effects of exposure to ultraviolet rays are so striking and easy of demonstration that there has been a tendency to expect only beneficial results from irradiation, regardless of intensity and 'dosage'.

Some of the effects on the blood and circulation have already been determined with sufficient accuracy to justify the proposed precautions. Not long ago it was shown by Miles and Laurens¹ that the exposure of dogs to carbon arc radiation may give rise to variable results with respect to the changes in the content of erythrocytes in the blood. Depending on the dosage, increases and decreases were noted. Their results were interpreted, however, to indicate a stimulation of the hæmatopoietic system. A continuation of the study, by Mayerson and Laurens,² shows that changes in the plasma volume also may take place. For example, the primary result of an individual exposure was a temporary increase in the plasma with recovery to normal within a few hours. This dilution of the blood occurred again but was not augmented by further exposures, its duration being determined by the strength of dosage and the interval between successive exposures. After massive exposures a slight concentration followed the initial dilution. Repeated exposures stimulated the hæmatopoietic organs to produce an increased number of red cells that persisted for several weeks after the last irradiation. However, indexes of colour, volume and saturation showed that the red cells in the period after irradiation are usually smaller and less saturated than before the treatment. Furthermore, a progressive leukopenia may develop.

These are phenomena that must be evaluated

with some caution. Mayerson and Laurens assert that erythrocytes may actually be destroyed by excessive irradiation with massive exposures. Such destruction is surely not a therapeutic desideratum. These investigators, who have had large experience in this field, believe that many of the conflicting results reported are without question due to the variation in the intensity and character of the radiation, the specifications of which are rarely given. However, as radiation does act as a hæmatopoietic stimulus to the normal relatively stable organism. Mayerson and Laurens regard it as plausible at least that it would be particularly efficient in effecting regeneration in anæmic conditions. The persisting uncertainty should act as a warning against undue ventures that may actually border on quackery, until further explicit knowledge is available."—*J. Am. M. Ass.*, 1928, xci, 1038.

REFERENCES

1. MILES, A. L., AND LAURENS, H., *Am. J. Physiol.*, 1926, lxxv, 462.
2. MAYERSON, H. E., AND LAURENS, H., *Am. J. Physiol.*, 1928, lxxxvi, 1.

HOW CAN WE BEST PREVENT THE CONTRACTING OF COLDS?

"Here we would like to draw attention to the great danger just before our furnaces are lighted in the fall and after they are allowed to go out in the spring. At such times we are likely to sit in a temperature that is colder than the heat generated by our bodies can counteract. A temperature that is perfectly safe and even wholesome to move around in when we have a reasonable degree of physical exercise may be, and in fact is, a source of danger if we are sitting still or lying down. This should be our guide as regards additional clothing and heat.

Another not infrequent way by which the resistance of our bodies is reduced and the temperature lowered out of proportion to the amount of heat produced, is by getting wet or by cold and damp feet. In this case, there is necessarily an increased amount of evaporation going on and this is always attended by a decided loss of heat from the body.

On the other hand, there is the danger of dressing too warmly. This error applies more particularly to the so-called winter under-clothing which, as a matter of fact, should be very little, if any, heavier than that worn in the summer. We must bear in mind that in our homes, in our offices or places of business the temperature by our artificial means of heating during the winter time is practically the same as that which we enjoy in the summer time. Why, then, should we require any heavier clothing? The time for the heavier clothing is when we go outdoors into the cold air. If we

have heavy underwear, the chances are our skins will be bathed in perspiration, which will very materially expose us to cold when we go out, on account of the rapid evaporation of this perspiration.

Then there is the regulation of the diet. It must be borne in mind that our food constitutes the fuel and if it is not carefully selected it will not generate the necessary amount of heat, particularly in the winter. We require to see to it that our food is of such a character as will supply an ample number of calories. We must, therefore, choose food with heat-producing qualities—carbohydrates and fats.

In fact, the violation of any of the laws of personal hygiene has a tendency at all times to materially lower the resistance of our bodies and thus predispose us to colds or other diseases. Overwork, either physical or mental, so as to cause fatigue, also loss of rest and worry, all have a tendency to lower the vitality and constitute predisposing causes that are to be guarded against as far as possible.

Skin gymnastics are oftentimes beneficial. That is, it is well to begin in the early fall by taking tepid or cold baths or shower baths, or, if this is not convenient, to sponge the face, neck and chest with cold water every morning and to take occasional air-baths, that is, after the regular tub bath, whether it be warm, tepid or cold, and follow by a brisk rubbing.

All these have a tendency to give tone and resisting power to the surface of our bodies.

However, these are only auxiliaries. The main thing is to not leave anything undone that is essential to keep us physically fit. It must be apparent that proper nutrition, a properly balanced diet and the securing of a proper assimilation of our food and regularity of the evacuation from the body, both from the bowels and kidneys, are all extremely important."—*Health Bulletin*, Dept. of Public Health, Toronto, Sept. 22, 1928, vol. ii.

THE UNDERWEIGHT CHILD

"Undernourishment is a particularly menacing feature in relation to childhood because of the large numbers of individuals that seem to be involved, especially in certain parts of the world. As with any other deviation from the normal it is disconcerting, but notably so if it occurs at a period when maintenance of weight is not an index of welfare as it may be during adult age. Gain and growth are striking characteristics of the young. Undernourishment may be secondary to a variety of pathological conditions which make an otherwise adequate dietary ineffective. However, this is by no means the universal situation in the cases that commonly obtrude themselves on our notice. A recent study of underweight children by Wang, Hawks and

Hays* at the Nelson Morris Institute for Medical Research in Chicago indicates that the ability of such young persons to absorb and store nitrogen is fully equal to or greater than that of the usual "normal" child. Undernutrition therefore does not necessarily impair the alimentary functions, for the average absorption commonly exceeds 90 per cent of the intake. The fact that the nitrogen retention increases with the degree of underweight, as the experiments clearly show, indicates to the Chicago investigators that as the child gains in weight he is building muscular tissue as well as storing fat. Evidently the protein requirement of underweight children may be greater than that of the "normal" individual of the same age. Therefore, Wang and her co-workers conclude, in computing diets for underweight children, the protein as well as the caloric intake should be computed according to the standard, rather than the actual, weight of the child in question."—*J. Amer. M. Ass.*, Sept. 15 1928.

THE HISTORY OF HOSPITALS

"Some time ago it was not unusual to find in histories of the rise of Christianity on the ruins of paganism the statement that public charity to the sick and the establishment of hospitals were unknown before the days of Constantine the Great. A wider view of the ancient world, based on a greater knowledge of ancient society in Asia, as well as Europe and Northern Africa, has shown that hospitals for the sick were established long before the Christian era.

The Vicary Lecture on this subject, delivered by Dr. George Parker of Bristol, has recently been published in the *British Journal of Surgery* (1928, xvi.). Dr. Parker has surveyed the whole field, and as a result of his studies is able to assure us that 'the earliest beginnings we know of can be traced to about the sixth century, B.C., in places far apart, both in the West and distant East.' It is a curious and unexplained fact that there is no evidence of the existence of hospitals in Assyria, Babylon, early Egypt, or China. In the case of Egypt their absence is hardly surprising, seeing that the true Egyptian culture had disappeared by the sixth century, B.C. It is, however, surprising that China, which so readily accepted Buddhist teaching, should not have adopted the Buddhist practice of founding hospitals; yet, as far as we know, there were no hospitals in China until, in quite recent years, they were established by Christian missionaries. We confess to some surprise at Dr. Parker's statement that 'In England, besides monastic infirmaries, 577 hospitals and asylums were founded between 1100 and 1400.' As the population in 1400 is not likely to have exceeded three millions, and after the ravages of the Black Death was probably much less, this would give a ratio of

one hospital or asylum to every 5,200 of population, leaving out of account the monastic infirmaries which Dr. Parker excludes. No doubt many, if not most, of these establishments were not hospitals in the modern sense of the word, but refuges for the sick poor, just as the existing St. Bartholomew's Hospital was in its earlier days. This is a distinction which Dr. Parker is careful to draw, but making, as he does, large deductions on this account, the number of places for the treatment of the sick and wounded, in non-Christian as well as in Christian lands, is simply astounding. It is to Gautama and his followers that we owe, apparently, the hospital idea. Buddhist hospitals in India existed before the invasion of Alexander, which, moreover, only touched the northern part of that country. The Persians early founded hospitals, and at Gondishapur we are told that there was a flourishing medical school, composed partly of Zoroastrians and partly of Nestorian Christians. In Greece, as is now well known, there were numerous institutions of the Aesculapian cult, where cures were wrought more by magic than by medicine. The more scientific Hippocratic schools do not appear to have had hospitals at their disposal, although there is not much evidence on this point. We cannot follow Dr. Parker in his fascinating study of the Christian hospitals, and must content ourselves with a warm recommendation of his lecture to all who care for this interesting section of the history of medicine; nor will space allow us to do more than mention his researches into the history of Moslem hospitals, which are full of instruction for most of us." *Brit. M. J.*, 1928, ii, 540.

CHRISTIAN SCIENCE AND THE DOCTOR

"Medical men who read the daily newspapers are probably aware that a schism has arisen in Christian Science ranks. The Christian Science Parent Church, some four years old, is considerably younger than the other member of the family, the Church of Christ Scientist. The word 'parent' is a little confusing, therefore, but it will be recalled that W. S. Gilbert raised much the same question in the case of the immortal Iolanthe, and some years ago (unless our memory has played us false) there used to be a standing debate on whether the hen was the mother of the egg or the egg the mother of the hen. It is not for us to comment on the heresy hunt which has started, but there is some interest in one of the points at issue—namely, the relationship of Christian Science teaching and practice to the medical profession. From literature sent to us by Mr. John V. Dittmore, contributing editor of the *Christian Science Watchman*, it appears that the Parent Church, founded by Mrs. Annie C. Bill in 1924, is convinced that the time has arrived for some recognition of the doctor by the Christian Scientist, or of the physician by the metaphysician, as Mrs. Bill prefers to call him. Both Churches profess allegiance to the doctrines

* Wang, Chi Che, Hawks, Jean E., and Hays, Bertha B., Metabolism of Undernourished Children, V. Protein Metabolism, *Am. J. Dis. Child.*, 1928, xxxv, 968.

of Mary Baker Eddy; but the Parent Church produces ingenious arguments to show that the foundress of the faith was preparing the way for the recognition by her disciples of medical aid as an adjuvant of faith, when death ended the suffering for which she had been compelled to resort to injections of morphine. In the early stages of evangelization—so the argument runs—it was necessary to forswear medical methods in treating disease in order to emphasize the importance of 'methods of mind.' But the distressing fact remained that the majority of mankind rested its hope of recovery upon 'materia medica,' and since one of Mrs. Eddy's axioms was that 'the greater controls the lesser,' it became easy to see that her sufferings were 'caused mainly by the majority of false beliefs of mankind.' Vain was the dismay of Mrs. Eddy's students; vain their attempt to hide the doctor's visits, or prevent their leader's resort to the drug. While the majority of people continued to hold wrong beliefs Mrs. Eddy could not escape from suffering. The time was ripe, therefore, for the second period of the crusade, the 'destruction of the degenerate element of wrong beliefs in which all disease originates.' And so Mrs. Eddy took to morphine. The Parent Church alleges, with some show of reason, that the other group is illogical in its attitude towards drugs. Since all is mind, and there is no matter, it is plain that drugs are only a part of mind, or 'parts of the phenomena of the human mind.' Mrs. Eddy was justified, therefore, in the intelligent utilization of the 'vehicle' of the human mind operating in that special mode. But the older type of Christian Scientist—the argument proceeds—is not justified in building hospitals, in miscalling them 'benevolent sanatoriums,' in preparing for the reception of diseased conditions, while all the time students of the cult are being taught that 'to permit disease to be present in the thought must bring it into the experience of the individual.' Far better that he should come over to the Parent Church, and invite the aid of the doctor in destroying the degenerate element of wrong belief by means of the immaterial vehicle, materia medica. It remains to be seen how far the physician will advance to meet the proffered embraces of the metaphysician, and co-operate in 'healing disease on the highest moral and spiritual basis,' so that 'Christian Science will be universally acknowledged to have brought to humanity the missing healing element of pure mental energy.' There is a type of mind within our profession which can discover in Hahnemann the father of rational dosage, and in Gall the

father of brain localization; for such it may not be too great an effort to regard Mrs. Eddy as the mother of psychotherapeutics. In the meanwhile it is not without significance that there are Christian Scientists to-day who can allow to the medical practitioner some merit in dealing with disease, and it will be interesting to watch the effect of the new by-law of the Parent Church, which renounces commercialism and 'financial rivalry with medical specialists.'—*Brit. Med. J.*, 1928, ii, 503.

ON THE INTERPRETATION OF DECREASING MORTALITY RATES

"During the past twenty-five years mortality rates generally throughout the United States have had a downward trend. Different agencies undoubtedly have assisted in bringing about this fortunate situation. A preliminary report on five years of work in the health demonstrations of the Millbank Memorial Fund disclosed a reduction during the five years of approximately one-third in the death rate from tuberculosis and of nearly one-fifth in the infant mortality, which was attributed entirely to the health demonstrations of this memorial fund. It was also stated that the death rate in Syracuse from tuberculosis in 1927 was the lowest the city ever had. The *Journal of the American Medical Association* points out that a review of health conditions in the State of Illinois for the last seven years indicated that the deaths from tuberculosis and the infant mortality rate in that state have also decreased about 25 per cent, and Illinois claims that no other state in the union with a population in 1920 of four millions and more has reported an average annual death rate so favourable. Yet there was no health demonstration by the Millbank Memorial Fund in that state.

Eminent statisticians shake their heads sadly over the statistical claims of such propaganda. Allowance must always be made for changing economic situations, for general trends, and for the many other factors that should ever be considered. Undoubtedly the Millbank Memorial Fund has exerted a most beneficent influence; nevertheless the report of so short a period cannot be taken as conclusive evidence of the beneficial effects of any one agency in any one health field."—Editorial, *J. Am. M. Ass.*, Aug. 25, 1928.

Fatal automobile accidents are assuming more serious proportions every year in Canada. Only two years ago the death rate at the end of August was 4.8 per 100,000. It is now 7.3—a rise of 52 per cent in this short time.

"Let every parent remember that there is no greater affliction that can be thrust upon a child than that of inheriting the type of parent who refuses to let him grow up."—*Health Bulletin*, Toronto, 1928, viii, 2.

Abstracts from Current Literature

MEDICINE

The Lettsomian Lectures on Rheumatic Heart Disease in Childhood. Poynton, F. J., *The Lancet*, 1928, ii, 537, 585, 637.

Poynton's work on the etiology of acute rheumatism is too well known to require comment. Anything that comes from his pen on the subject is deserving of careful consideration.

Among the predisposing factors in connection with rheumatic fever he places strong emphasis on heredity and a nervous element, but thinks that there may be other causes related to diet and endocrine disturbances that have not been sufficiently studied. Dampness is less important than climatic changes. The dust of the streets may cause sore throats and thus rheumatism. The "tonsil problem" is not yet settled satisfactorily. While the tonsils, when healthy, must prevent infection, it is hard to be sure just when this function fails and the tonsil becomes a positive danger. And we still have too little information as to the frequency with which rheumatic fever occurs in children who have had their tonsils removed.

One of the greatest difficulties is to know when the carditis, so often associated with rheumatism, comes to an end. Dr. Poynton thinks that, in view of the fact that death rarely occurs during the earliest stages of the disease, and that we know so little as to the method of bacterial invasion of the body in the case of rheumatism, we have insufficient information to decide this question with certainty.

The lecturer still holds, as he did twenty-five years ago, that malignant endocarditis will give the clue in the matter of causation. He thinks, also, in harmony with his well-known views regarding the etiological relationship of a streptococcus in rheumatism, that malignant endocarditis is due to a fulminating infection with the primary organism, and is not secondary.

If mitral stenosis of rheumatic origin could be prevented in the young the after history of rheumatism would be much less terrible. Dr. Poynton has not found that vaccines and sera are of value in the treatment of malignant endocarditis of rheumatic origin.

In regard to the medicinal treatment of acute rheumatism Dr. Poynton deprecates the use of large doses of salicylate of soda in weakly children. Tolylin, a cinchonic acid preparation, is preferable, as it is without toxic effects. This is a valuable addition to the short list of drugs that can influence the rheumatic infection. The results of sanatorium treatment giving prolonged rest in heart cases have proved encouraging.

A. G. NICHOLLS

Chronic Non-valvular Disease of the Heart.

Christian, H., *J. Am. M. Ass.*, 1928, xci, 549.

This article has to do with cases with heart symptoms in which there is no evidence of disease of the endocardium or pericardium. The heart may or may not be enlarged. There may be no demonstrable lesion of the myocardium, even where the death is from cardiac failure. There may be signs of recent degeneration, but not of anything of long standing enough to cause the cardiac inefficiency present. Small foci of infiltration may also be discarded; widespread fibrosis is occasionally found as is the fibrosis following an infarct.

The disability is entirely from inefficiency of the heart muscle. Most of the patients are more than 40 years of age. Is the disturbance in the heart muscle functional? Electrocardiograms do not throw any more light on the question. A possible explanation is myocardial exhaustion, which is present after infections or debilitating disease has caused some change.

There are patients with hearts that are upset by slight exertion, who feel respiratory distress, pressure over the heart area, and in whom the heart rate is easily accelerated. There may be extra-systoles. This condition resembles cardiac asthenia, but is more curable. Rest and assurance usually are helpful; above all the patients must not be allowed to think that they have heart trouble.

Between this class and the cases with extensive fibrosis of the cardiac muscle there is a large group, usually past forty years, in which hypertrophy of the heart is the only sign, and this hypertrophy seems to be the chief cause of trouble. It is possible that the cause of the hypertrophy is one or more minor infections, unnoticed because of their mildness. Cardiac hypertrophy almost always has a grave prognosis, as it indicates a progressive heart lesion. Cardiac arrhythmias do not play an important part in these cases. On the other hand, many of these cases are diagnosed asthma, chronic bronchitis, nephritis even, when the urine is decreased and shows albumen; all because the cardiac enlargement, being the only evidence of heart disease, is not easy to demonstrate. A therapeutic test with digitalis would establish the diagnosis easily. Digitalis is of great help in all these cases, clearing up the dyspnea, edema, etc. The type of chronic myocarditis which follows hyperthyroidism should of course be regarded from the point of view of prevention. Even after auricular fibrillation has developed thyroidectomy may effect a cure.

The author closes with a reference to cardiac dilatation, which he considers so rare a condi-

tion, apart from hypertrophy, that he is not sure the term should be used at all.

P. M. MACDONNELL

Ueber die Bedeutung der Epithelkörpervergrößerung bei der Ostitis fibrosa generalisata Recklinghausen. (On the significance of enlargement of the parathyroid bodies in regard to osteomalacia.) Gold, E., *Mitteil. aus d. Grenzgeb. der Med. u. Chir.*, 1928, xli, 63.

The author describes a case of Recklinghausen's generalized fibrous osteitis, otherwise osteomalacia, from v. Eiselberg's clinic in Vienna, occurring in a woman of fifty-four years. A benign adenomatous tumour of the right upper parathyroid gland was removed. Six months later, the patient was found to be much improved in health generally, experiencing a return to vigour and exhibiting a gain in weight of 11 kilos. Previously to operation the blood calcium had been increased 30 per cent; after, it had sunk to normal. The calcium elimination by the urine, which before operation had been more than double the normal amount, was now reduced to one-third normal. This observation affords an interesting illustration of the importance of the parathyroids in connection with the calcium metabolism, this being probably a case of hyperparathyroidism.

A. G. NICHOLLS

La Vaccination Préventive de l'homme contre la fièvre dite ondulante. (Preventive vaccination in man against undulant fever). Roziès, H., *Le Progrès Médical*, 1928, xxxix, 1583.

The author refers to the pioneer work of Nicolle and Conseil in establishing on a scientific basis and beyond dispute the value of vaccination in the prevention of undulant fever or Malta fever, both by the subcutaneous and the alimentary avenues. Three vaccines used by subcutaneous injection are referred to: (1) the English vaccine, Eyre's modified type; (2) Nicolle and Conseil's vaccine; and (3) the vaccine of Ranque and Senéz. The author concludes that the available evidence is insufficient to warrant a definite appraisal of the value of the first-mentioned vaccine.

Nicolle and Conseil's vaccine consists in a mixture of *Br. melitensis*, *para*, and *Br. abortus*. It was originally given twice, at weekly intervals, in doses of 900,000,000. Later 800 to 1,000 millions were given by three injections. The efficiency of their vaccine has been definitely proved.

The vaccine of Ranque and Senéz is composed of *melitensis* treated with iodine. Three injections are given at intervals of five to seven days in amounts of 500, 750, and 1,000 millions respectively. Insufficient investigation has been carried out to establish the value or otherwise of this vaccine. The article gives the arguments

for and against the buccal route in the attempt to produce immunization.

The author concludes that there is no doubt as to the efficacy of the subcutaneous method of vaccinating against Malta fever, and this is to be preferred. He quotes Professor Renon as follows: "We may accept both methods. Vaccination by injection when we can, because the results are known and sure. When this plan is not possible it is our duty to use the enterovaccine by the gastro-intestinal route."

A. G. NICHOLLS

SURGERY

Acute Intestinal Obstruction Due to Impacted Gall Stones. Powers, J. H., *Surg., Gynec. & Obst.*, 1928, xlvii, 416.

Intestinal obstruction due to gall stone is by no means rare, and the four cases reported in this contribution occurred in 179 patients operated on for intestinal obstruction at the Peter Bent Brigham Hospital, Boston, Mass.

The mechanism by which gall stones reach the gastro-intestinal tract is that the process begins with cholecystitis and cholelithiasis, followed by ulceration, erosion, and pericholecystitis. Adhesions form between the gall bladder or ducts and the surrounding viscera, perforation occurring within the adhesions. By far the largest number of perforations occur between the gall bladder and duodenum, but fistulae have been found between the gall bladder and the stomach, jejunum, ileum, colon, and urinary bladder, as well as between the common duct and stomach or duodenum. Perforations may occur without any attending symptoms, as in a case reported by Reimann and Bloom. Approximately one-half the patients recover without operative aid, the stone being gradually passed onward through the bowel. In Wagner's series, 93 passed the stone by rectum, 159 were operated on, and 82 died without operation.

Martin states "the diagnosis of gall-stone ileus is seldom made with certainty", but Murphy, on the contrary, believes that "ileus due to a gall stone which has perforated through the gall bladder into the intestine may have no preceding jaundice but the inflammatory symptoms which accompany such a perforation ought to suggest the diagnosis."

Subcutaneous and intravenous administration of salt solution before operation forms a very important adjunct in treatment, thereby correcting the alkalosis of intestinal obstruction. It is advisable to remove the stone through a transverse incision in order to avoid such constriction of the intestinal lumen as occurs when a longitudinal incision is closed and inverted.

R. V. B. SHIER

Multiple Polyposis of the Colon. Hullsiek, H. E., *Surg., Gynec., & Obst.*, 1928, xlvii, 346.

A single polyp of the colon is not a rare occurrence; neither are multiple single polyps in the same bowel uncommon. Areas of polyposis, which are the result of ulcers, strictures, carcinoma, or other mucous membrane irritation, are frequently encountered, but the type of polyposis occurring in young people, in which normal mucosa is replaced by countless small tumours, is not of common occurrence. Erdmann and Morris termed this latter form "adolescent, congenital, disseminated polyposis."

Lockhart-Mummery classifies adenomata in the bowel as: (1) true; (2) polyps associated with hyperplastic tuberculosis; (3) multiple polyps associated with old stricture; (4) a polypoid condition resulting from ulcerative colitis. Erdmann and Morris classified on a clinical basis: (1) the adult acquired type, and (2) the adolescent, congenital, disseminated type. The congenital form becomes evident in childhood or youth, is often shown in other members of the same family, and has a high malignancy incidence.

Fifty per cent occur between the ages of 15 and 35 years and Cripps saw three cases in the same family. In the series studied by the author 53 per cent were males and 47 per cent were females. A definite hereditary tendency was noted in 13 cases, or 11.1 per cent. The area most commonly involved is the rectum and colon representing 41.8 per cent. Lockhart-Mummery states that "almost all recorded cases of multiple polypi of the colon eventually become malignant." The mortality rate was 47.2 per cent.

The surgical treatment, if adopted, varies from appendicostomy to complete removal of the colon. Erdmann in discussing the treatment of the condition is quoted as follows: "One may sum up the present status of treatment of this condition by saying that the only method which holds out any hope for cure in the disseminated variety is one imposing upon the operator great technical difficulties, upon the patient great danger, and upon both the possibility that a successful operation may prove fruitless because the operator has been unable to determine accurately the extent of the process and has, therefore, left behind areas capable of transmitting all the original potentialities of the disease."

The conclusions arrived at by the author are as follows: (1) There are two distinct types of polyposis: acquired and congenital. (2) Multiple polyposis is most common in childhood and youth, the average age in this entire series being 30.9 years, with more than 65 per cent occurring before 35. (3) The symptoms usually persist for a long time before medical attention is sought. (4) Males and females are affected about equally. (5) There is a definite hereditary

tendency. (6) The mortality is high, 47.2 per cent under all forms of treatment. (7) The treatment is not yet standardized.

R. V. B. SHIER

Trauma as a Factor in Acute Appendicitis.

Bissell, A. H., *Arch. of Surg.*, 1928, xvii, 672.

From a medico-legal standpoint it seems to be generally considered that injury is never a factor of any great importance in giving rise to acute appendicitis, and consequently compensation is usually withheld in cases of this nature. There is, however, evidence to show that trauma may play an important rôle in determining the onset of acute appendicitis. Von Neumann stated the incidence of such cases to be 6.6 per cent and several others have reported cases of traumatic appendicitis. Deaver's view is that whenever appendicitis occurs as the result of injury it will be found that the appendix shows previous disease, such as foreign bodies, concretions, strictures or adhesions, which do not necessarily cause symptoms in themselves.

It has been shown experimentally that pressure on the abdominal wall can force the contents of a full cæum into the appendix. It is logical to assume that a blow can do the same thing and if the conditions of disease mentioned are present the consequent rupture of the appendix is quite conceivable. Any increase in the diameter of the appendix gives rise to three times as great an increase in its circumference.

It is not necessary to assume that a sudden high pressure in the appendix will cause a perforation. There may be intermediate stages of damage such as tears of the mucosal lining, or a concretion may be forced into the tip and cause ultimate necrosis.

Dr. Bissell reports four cases in support of his contention. Each of these had been in good health and had had no previous abdominal symptoms. There was in each case a history of severe trauma, such as a fall, or a kick, with immediate abdominal pain, nausea, and vomiting. The symptoms were continuous up to the time of operation. In each case the appendix was found to be perforated opposite the mesentery, and in each case faecal concretions were found either in the appendix itself or in the pus surrounding it.

H. E. MACDERMOT

Sur Un Signe Radiologique des Perforations d'Ulcères Gastriques ou Duodénaux. (On a Radiological Sign of Perforation of Gastric or Duodenal Ulcers). Du Pasquier, G., *Révue médicale de la Suisse Romande*, 1928, xlviii, 785.

The diagnosis of perforation in the case of peptic ulcers is usually easy. Yet cases arise in which careful clinical examination leaves the

physician in doubt, a doubt that is the more distressing since the time for successful intervention is necessarily short. In cases of doubt operation is better than delay, but, of course, this procedure is not devoid of danger nor of other objections. Hence the importance of an early precise diagnosis.

One of the diagnostic signs of perforation of one of the abdominal viscera that is most often spoken of, is a diminution or disappearance of the liver dullness. This is due to the escape of air into the upper zone of the abdomen below the diaphragm. Unfortunately, this sign is not invariable.

X-ray examination usually reveals a collection of gas below the diaphragm, as Assmann, Vaughan and Brams, and Brams and Meyer have shown. This observation is confirmed by Du Pasquier. The picture is very typical. It shows a clear crescent, more or less dense, according to the amount of gas that has escaped, the convexity of which is formed by the diaphragm and the concavity by the liver. The diaphragm itself is seen as a thin dark band, well defined, which separates the collection of air from the clearness of the neighbouring thoracic cavity. The crescent is best seen on the right side, being somewhat obscured on the left by the stomach. The author considers this to be diagnostic and reports three cases in which an accurate conclusion was reached through radiological methods. He does not advise repeated x-ray examinations under the circumstances, nor should the patient be moved to the x-ray department.

He concludes that a rapidly conducted radiological examination does not aggravate the condition of the patient, even when he is extremely shocked, but does not think that operation should be unduly delayed in order to permit of the attendance of the radiologist.

A. G. NICHOLLS

OBSTETRICS AND GYNÆCOLOGY

Die Puerperal Sepsis. (Puerperal Sepsis).

Schottmüller, H., *Münchener med. Wchnschr.*, 1928, lxxv, 1589, 1634.

This article discusses very fully and scientifically the subject of puerperal sepsis, which is occupying so much attention at the present time. It begins with a historical retrospect and then goes into the etiology, particularly in regard to the micro-organisms that may be at fault. The pathology is also dealt with at some little length, including the sequelæ and complications. Professor Schottmüller thinks that puerperal infection falls into two groups, corresponding to wound-infection and wound-intoxication. The former may be due to a variety of pathogenic micro-organisms, of which the streptococcus is

the commonest and the most virulent; the latter, due to putrefactive germs (saprophytes).

In the matter of treatment the author lays stress upon the following points. When too little fluid is being ingested drip enemata of 10 per cent glucose solution should be administered. If the patient is very anæmic blood transfusion of from 500 to 800 c.c. is indicated. In cases due to infection with hæmolytic streptococcus injections of blood from persons convalescing from the same type of infection should be tried, in the hope of providing the necessary antibodies. For failing heart strophanthin should be given, and Schottmüller thinks that adrenalin intravenously is of benefit, though this remedy has of late been somewhat overlooked. Antipyretics are of no lasting value, nor are the newer antiseptics of use, such as, collargol, electrargol, optochinin, argochrom, argoflavin, and trypanflavin. Schottmüller does not think it possible to attain "internal disinfection." Vaccines and sera he has not found of value in infections so acute as the puerperal form, nor is non-specific protein therapy reliable. Curettage of the uterus, to clear out fetal remnants, is recommended, provided that the os is dilated. This procedure is safer than manual removal. It is seldom that surgical intervention is called for, for the reason that it is not often possible to localize and deal with suppurative foci. Only two indications exist for extirpation of the uterus: (1) gaseous phlegmon of the uterus, or puerperal tetanus, and (2) septic thrombophlebitis.

In the important matter of prophylaxis, while admitting that infection may be introduced from without, Schottmüller is of the opinion that the danger is greater from within, i.e., from micro-organisms present in the vagina before labour. He emphasizes the necessity of ensuring, after the termination of labour, that the uterus and vagina be free of debris and blood clot. Many cases of puerperal sepsis are, moreover, to be attributed to criminal practices in the earlier months of pregnancy.

A. G. NICHOLLS

PÆDIATRICS

Tetanus Neonatorum. Smith, D. L., *Arch. Ped.*, 1928, xlv, 562.

A child ten days old had developed spasms and stiffness of the jaws on the third day. The spasms gradually became generalized, convulsions occurring every day; there was some fever, but no vomiting. The baby would not nurse and refused feeding with a spoon.

Examination showed the child to have trismus and marked retraction of the neck. Muscular spasms were easily incited by handling the baby. The navel was red and with a discharge of bloody pus. The temperature was 101.5.

On admission to hospital the child was given 1,500 units of antitetanic serum with ten minims of magnesium sulphate (50 per cent aqueous solution) intramuscularly. The anti-toxin and magnesium sulphate were repeated the next day, together with five grams of chloral hydrate in water given by rectum every four hours. The child was much quieter in the day but still had some trismus and marked opisthotonos. There was marked improvement in the next three days. The magnesium sulphate hypodermically seemed to relieve the spasms brought on by feeding, which constituted a most troublesome feature. The formation of excessive mucus was checked by atropine gr. 1/900, given every four hours and the cyanosis and dyspnoea were relieved by caffeine sodium benzoate, 1/2 gr. given hypodermically after each feeding.

The child gradually improved and was discharged after twenty-three days, perfectly well. The tetanic symptoms subsided slowly, and it was frequently necessary to give some form of stimulation after feeding on account of the cyanosis and weak pulse which the act brought on. The caffeine sodium benzoate seemed to be sufficient for these and epinephrin 5 minims was also used with good effect. Otitis media also occurred as a complication, but it cleared up on opening of the ear drums.

The case is worthy of notice on account of the high mortality attending the condition. The note is made that a case of tetanus had occurred in the same house two years previously.

H. E. MACDERMOT

PATHOLOGY

Multiple Primary Neoplasms in Lower Animals.

Feldman, W. H., *Am. J. Path.*, 1928, iv, 497.

The occurrence of one or more primary tumours in the human subject is not uncommon and has been the subject of a fair number of articles. In the lower animals the observation is much rarer, chiefly owing to the fact that most of them do not have such long lives as man; especially, of course, is this the case with those species that are used for food. It is well-recognized now that the lower animals may be affected by the same kinds of tumours that are found in man, and there is no obvious reason why new growths should not be multiple in them, except for the reason just mentioned. References to this phase of the matter are rare in the English literature.

Feldman reports the case of a thirteen-year-old male shepherd dog who was the subject of the following neoplasms; recurrent squamous-celled carcinoma of the mouth, with metastasis in a regional lymph-node; multiple hæmangiomata of the liver; malignant leiomyoma of the cæcum; papillary cystadenoma of the prostate;

a testicular tumour arising from the interstitial (Leydig) cells; and multiple lymphomatous nodules in the spleen.

The author points out that multiple neoplasms are frequently found in dogs more than ten years old. This suggests the influence of senile retrogression and subsequent tissue involution in the etiology.

A. G. NICHOLLS

THERAPEUTICS

Problems in the Treatment of Ascites. Snell, A. M., *Med. Clin. N. Am.* May, 1928.

The multiplicity of the causes of ascites has been recognized since the time of Galen. Cases presenting this sign fall into two groups; the larger being those in which the underlying disease may be quite easily identified; the smaller, a group in which the diagnosis is an extremely complex problem. Among useful aids in this problem are the liver function tests and the newer diuretics. Ninety per cent of hepatic ascites cases show some retention of dyes — bromsulphthalein or phenoltetrachlorophthalein — a marked retention suggesting primarily a liver fault, while slight retention suggests secondary liver effects from environmental or circulatory changes.

A "therapeutic test" with the diuretics — ammonium salts and merbaphen — may contribute information as to the cause of ascites. A failure of the abdomen to alter in contour following diuresis may indicate encysted fluid or peritoneal thickening. In cases of non-tuberculous polyserositis diuresis gives a welcome substitute for repeatedappings and at times gives prolonged relief. It is thought that a poor response to the diuretics in cirrhotic ascites may indicate a poor prognosis.

The author urges that, in cases of ascites from obscure causes, a careful investigation of cardiovascular and renal systems should be made. Dye tests of hepatic function and serum bilirubin tests should be followed by a cautious therapeutic trial of the diuretics.

J. B. ROSS

Peptone Treatment in Bronchial Asthma.

Ramirez, M. A., *Arch. Int. Med.*, 1928, xlii, 368.

This paper opens with what the author feels to be the somewhat sweeping statement that no conclusive study of bronchial asthma has as yet been presented. But when we consider how closely the asthmatic state is linked with the problem of anaphylaxis and desensitization, and how confused our knowledge is regarding these latter subjects, the statement becomes more acceptable.

Dr. Ramirez then introduces the subject of non-specific desensitization, showing how we have given up the original idea of specific methods, and that now a large number of

protein substances are employed in non-specific therapy; but we still have no sufficient explanation for the success (not always complete) which it has achieved. The substance whose employment is considered in detail in this paper is peptone. It would be logical to expect that the chemical constitution of the particular brand of peptone used would have a definite and characteristic influence, but a review of the opinions of various workers shows that they differ greatly on this point. Auld, who is one of the chief supporters of peptone therapy obtained unfavorable results with Witte's peptone owing to its histamine content, but other workers found that even with the preparation suggested by Auld the results were disappointing, and even dangerous. The method of administration also varies with different workers; some give it by mouth, some intravenously, some intradermally and others subcutaneously, and whereas some claim good

results with the latter, others insist on the intracutaneous route being the better, since it is claimed that sloughing will be produced by subcutaneous injections.

Dr. Ramirez has employed the various preparations of peptone and the various ways of administering it, in a series of 60 cases, and from the results obtained he concludes that this substance is of no value in bronchial asthma. In 40 cases the peptone was given either intramuscularly, intradermally or by mouth. No effect at all was noted. In ten more cases it was given intravenously, one c.c. of a 5 per cent solution twice a week for four weeks, in half the cases, and 2 c.c. once a week for four weeks in the other five. Slight improvement only was noted. In ten other patients Auld's method of intravenous injections was followed, but no success was obtained.

H. E. MACDERMOT

Obituaries

Dr. Donald Booth Holden, of Victoria, B.C., was a passenger on the ill-fated plane on which he was crossing to Seattle to meet Mrs. Holden, who was on a holiday visit with her son Pilot Alec B. Holden, chief of the Tacoma Air-Port Station. Many passengers had been carried to Vancouver and Seattle and everyone had enjoyed the safety and riding comfort of this new service, but August 25th was foggy and that, combined with the smoke of forest fires, was apparently the cause of low flying and contact with the water near Port Townsend, half an hour after leaving Victoria. The impact with the water was severe enough to have brought sudden death to the passengers. Dr. Holden's body was recovered and was cremated.



Dr. Donald Booth Holden

Dr. Holden was born in Belleville, Ont., sixty-two years ago. When he was four years old the family removed to Montreal. He was educated at McGill University, where he graduated with the B.A. degree in 1889, and M.D., C.M., in 1891.

For thirty-seven years, Dr. Holden practised in Victoria, and at the time of his death was one of the senior members of the medical profession in that city in point of years of service. He was a hard worker, cheery, and bright withal; retiring, but to those who knew him best, he was possessed of a kindly heart and a cool calm courage which never failed him or his patient in emergency. Dr. Holden took a keen interest in his profession and upheld the best traditions of practice in his relations with his colleagues and patients. He was a member of the Victoria, British Columbia, and Canadian Medical Associations; a member of the Union Club, the Yacht Club, and Colwood Golf and Country Club. His beautiful home and gardens at "Beresford" provided pleasurable relaxation during the past few years. A memorial service was held on September 26th at Christ Church Cathedral, which was attended by members of the Victoria Medical Society, graduate nurses and the pupil nurses from both the St. Joseph's and Jubilee Hospitals.

Mr. A. R. Holden, K.C., of Montreal, a member of the law firm of Meredith, Holden, Heward, and Holden, and Mr. R. C. Holden, of Westmount, Que., are brothers.

To Mrs. Holden and family the sympathy of the whole profession is extended and we trust that the esteem in which her late husband was held will be a comfort in this hour.

Dr. Samuel Allison, one of the oldest residents of the County of Peel, died in Caledon East on October 1st in his ninety-fifth year. Born near Dixie, Dr. Allison had come to Caledon East as a young man, and had practised there for more than fifty years. He was a graduate of the old Victoria School in 1862.

Dr. F. J. Ball. On September 17th the members of the medical profession and the citizens of Regina

were alike deeply moved on hearing that one of their most honoured members had passed away in the person of Dr. F. J. Ball. Although he had been ill for the past month, still the hope that he would be around again was ever cherished by friends who grieved the more when the hand of death made all efforts futile.

The esteem to which he had attained was exemplified on the day of his funeral when his body lay in state at Knox Church surrounded by a bank of flowers, a tribute from those who knew him and those whom he had attended. With flags at half-mast in the city, with six of his intimate friends as pall-bearers and six of the medical profession as honorary pall-bearers attending, he was given a Masonic burial in the family plot.

Dr. Ball was born in 1865 at Rigby, Ontario, obtained his M.B. degree at Toronto University in 1893, and his M.D., C.M. at Trinity. He practised at Singhampton, Ontario, for twelve years, after which he went abroad and studied under some of the most eminent members of the medical profession, during which time he obtained his M.R.C.S. England, and his L.R.C.P. London. He was granted his F.A.C.S. in 1924. On return to Canada in 1907 he settled in Regina and built up a very extensive practice. In 1912 he limited his practice to consultations and surgery, and as such continued up to the time of his recent illness.

His professional bearing, kindly actions and friendly advice ever endeared him to the medical men with whom he came in contact, and won for him whatever honours they were able to bestow.

That he had not retired some years ago leads one to say that he practised his profession for the love of it rather than for financial gain. Dr. Ball leaves a wife and two sons to mourn his loss and the sympathies of the whole medical profession is extended to them.

S. E. MOORE

Dr. James Henry Duncan, of Chatham, died on September 22nd in his 78th year, following an attack of pneumonia. He was born in England but came to this country when four years old. He graduated in medicine from the University of Toronto in 1881 and settled in Chatham in 1884.

Dr. Duncan was one of the few remaining physicians of the old school—the family physician of the last generation—and was an active member of the medical societies and a familiar figure in all the gatherings of the profession.

Dr. Duncan leaves one daughter, Dr. Jean Renwick Duncan.

Dr. Charles Hector Godin, Superintendent of Marine Hospital Service for the Department of Health, and a prominent member of the medical profession died on September 24th, 1928. Dr. Godin, who was 56 years of age, had been ill for the past two months. He was widely known, his duties as Superintendent of Marine Hospitals taking him from coast to coast. For twenty-two years he was a member of the civil service, having been appointed by the late Hon. L. P. Brodeur to the Department of Marine and Fisheries, and later transferring to the Department of Pensions and National Health, when the Marine Hospitals' service was transferred to the latter branch of the civil service. Dr. Godin was born in Montreal, educated in the Montreal parochial schools, and also at Sherbrooke College, later entering Laval University, from which he graduated with honours in 1893. After practising his profession in L'Ange Gardien and Farnham, Que., he later returned to Montreal, and in 1906 he was appointed to the position in the civil service which he occupied for so many years.

Dr. R. Leprohon. The death of Dr. R. Leprohon, well known in French-Canadian medical circles, occurred on September 20th, 1928, after a lengthy illness. He was born in St. Charles, Que., on April 17, 1855. After completing his early studies he entered Bishop's College, where he graduated. Dr. Leprohon practised in the United States and on the Gaspé coast. In 1922, because of ill health, he returned to Montreal.

Dr. Neil MacPhatter, of Calgary, passed away on Monday, October 8th, 1928, after a very long illness, having been confined to his room for over a year. He was in his 79th year and graduated from the Royal College of Edinburgh, in 1881. Prior to registering in Alberta in 1922 he practised for many years in New York City.

Dr. J. J. McDermott died at Massey on September 12th, in his forty-fourth year. He was born in Ireland, came to Canada with his parents at the age of four, and received his education in Kingston, graduating at Queen's University. For many years Dr. McDermott was with the Spanish River Lumber Company, but retired later to a practice of his own at Sudbury. Dr. McDermott was not only active in practice but had been keenly interested in matters both religious and political.

News Items

GREAT BRITAIN

Darwin and Downe House

Downe House, in which Charles Darwin lived for nearly forty years, is now a gift to the nation, entrusted to the British Association for the Advancement of Science. More than a quarter of a century ago, Andrew Carnegie thought of buying it and putting up a sum of money to settle, as he phrased it, one way or another, the question of evolution. But those whom he consulted felt bound to advise him that, as a business proposition, the idea was unsound. Later on Sir Arthur Shipley, Master of Christ's College, Cambridge, where Darwin had passed his undergraduate career, urged that some way should be found of making Downe House a national possession. But the times were unpropitious. A few years ago

Professor H. F. Osborn, of New York, again propounded a scheme for transforming Darwin's home into an endowed centre for evolutionary research, and suggested that part of the funds might be supplied from America if the Royal Society would adopt and develop the idea. The Council of the Society, after friendly and detailed consideration, came to the conclusion that a very large sum of money would be required to transform a comparatively small country house into a research institution and to provide for its staff and maintenance. Even if the sum were available, it could be spent to greater scientific advantage in the development of some of the existing research institutions. At Leeds last year Sir Arthur Keith, then President of the British Association,

issued an appeal, with the authority of the Council, for the more modest object of preserving Downe House simply as a memorial of England's greatest naturalist.

The appeal had a swift and fortunate response, for Mr. Buckston Browne, a distinguished London surgeon, offered to buy the house, provide funds for its maintenance, and make it a gift to the nation in the custody of the British Association. With the generous co-operation of the Darwin family, the end has been achieved and the house and the eighteen acres in which it stands are now vested in the British Association. Some of the actual pieces of furniture used by Darwin in his study have been presented by the family, and Mr. Buckston Browne is collecting other pieces of the same period so as to reproduce as closely as possible the actual environment in which "The Origin of Species" and many other great books were written. All the editions of Darwin's books are being got together, and as soon as the lease can be acquired from the present tenants Downe House will be opened to the public. There is a superstition that the aura of evil deeds lingers in the premises in which they were committed. If there be no supernatural vestige left by great men, at least our imagination is quickened and our sympathies attuned to gracious memories by seeing the simple surroundings in which they thought and worked. The rooms in which Darwin wrote, the garden paths on which he paced, and the simple greenhouses in which he conducted his experiments, if only because they are homely and undramatic, can make us realize the possibilities of human achievement. For there patience and genius, the most faithful devotion to pedestrian fact, and the most daring imagination combined to bring about a stupendous revolution in human thought. Access to Downe House will preserve for all time the inspiring personality of the man who, in the words of Mr. Punch's inspired epitaph, was

"Recorder of the long Descent of Man,

And a most living witness of his rise."

—*The Weekly Times*, Sept., 1928.

Sir Horace Darwin

The death is announced, at Cambridge, of Sir Horace Darwin, son of Charles Darwin, and a great inventor and perfecter of scientific instruments.

Horace Darwin was born at Downe on May 13, 1851, the fifth son of Charles and Emma Darwin. He was educated at Trinity College, Cambridge.

Immediately after he had taken his degree, Horace went to the works of Messrs. Easton and Anderson, an engineering firm of high repute, and served his time as an apprentice. It was at this time that he designed his first scientific instrument, a klinostat, for recording the rate of growth of small plants.

On his return to Cambridge he became interested in the work that the late Mr. A. G. Dew-Smith was doing for the late Sir Michael Foster. Foster, who had recently been appointed to the Chair of Physiology, wished to equip the laboratory with apparatus and found that, practically without exception, all the instruments required for following up the recent work on nerves, blood pressure, etc., had to be imported from the continent. He interested his friend Dew-Smith, a rich amateur, who invited the co-operation of Horace Darwin, and together they started to produce instruments which were at least equal, and in many cases superior, to those of continental manufacture. A little later Darwin designed for his cousin, Sir Francis Galton, the series of anthropometric instruments with which so much of Galton's work was performed. With his brother, Sir George Darwin, he designed the bifilar pendulum form of seismograph for recording very small seismic disturbances. The rocking microtome was scientifically the most important instrument designed by Darwin. It was the outcome of the work of several men.

A few years before the outbreak of the War he was made a member of the Advisory Committee on Aeronautics, appointed to advise the government what researches should be made to develop the science of flight. He devoted all his energies to designing instruments for the new conditions introduced by air warfare. He was always ready to discard an idea of his own if he felt that the other man's design was better than his.

Sir Horace married in 1880 the Hon. Emma Cecilia Farrer, daughter of the first Lord Farrer, and leaves two daughters.

Street Noises

At a joint council meeting of the People's League of Health, held at 12, Stratford-place, London, on July 12th, a resolution was passed:—

"That in view of the fact that eminent neurologists and mental experts have emphasized the grave effect on the nervous system of noises which tend to increase the incidence of functional mental and nervous disorders in our midst, this meeting urges upon the People's League of Health the desirability of calling attention of the government to the need for the control and diminution of preventable noises in our streets, and asks that the subject shall receive the serious attention of the Ministry of Health."

A letter embodying this request has been forwarded to the Minister of Health, who has been asked to receive a deputation consisting of Sir Farquhar Buzzard, Sir Maurice Craig, Sir Robert Armstrong-Jones, Sir James Purves-Stewart, Dr. A. F. Tredgold, Prof. G. Robertson, and Dr. Thomas Beaton.

Sir Arthur Keith, Hon. F.R.F.P.S.

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on September 3rd, the honorary Fellowship was conferred upon Sir Arthur Keith, M.D., F.R.S. During the course of an "at home," given in the Faculty Hall to members of the British Association for the Advancement of Science, Sir Arthur Keith signed the roll of honorary Fellows. It will be recalled that last year Sir Arthur Keith was President of the British Association, and the subject of his address was "Darwin's theory of man's descent as it stands to-day."

The Medical Research Council

By an Order of the Committee of the Privy Council, Professor Robert Muir, M.D., F.R.S., Sir John Herbert Parsons, F.R.S., F.R.C.S., and the Right Hon. Sir Charles Philips Trevelyan, Bt., M.P., have been appointed members of the Medical Research Council, filling the vacancies caused by the retirement of Professor Georges Dreyer, Sir Archibald Garrod, and the Right Hon. William Graham, M.P. The new appointments became effective on October 1st.

The Bernhard Baron Trust

Mr. Bernhard Baron has by deed transferred the sum of £575,000 four per cent Consolidated Loan to trustees for the foundation of a trust to be called "The Bernhard Baron Trust for Hospitals and Asylums for Orphans and Crippled Children." It is provided that during the next twenty years the total amount available for distribution shall be approximately the same each year, and the trustees shall in every year apply such part of the capital and income of the fund as they deem fit for the benefit of hospitals of various kinds and homes and institutions for the care of orphaned and crippled children. The money available is directed to be applied in the proportion of 75 per cent among Christian and undenominational hospitals, homes, and asylums, and 25 per cent among similar institutions under Jewish control. The Marquess of Reading is nominated chairman of the board of

trustees, and the annual distribution will take place on December 5th of each year, which is the anniversary of the donor's birthday.

The Rockefeller Foundation and Cambridge University

The International Education Board of the Rockefeller Foundation has offered the sum of £700,000 for certain new developments in the Departments of Physics and Biology of Cambridge University. The amount mentioned includes a contribution of £250,000 for the proposed new University Library. Plans for this building have been prepared by Sir Giles Scott

provisionally, and the cost for building and maintenance has been estimated at £500,000. The condition attached to the Board's offer is that the University shall raise the balance of the amount necessary to complete the whole scheme. For this purpose a balance of £229,999 is required.

The retiring Vice-Chancellor, the Rev. G. A. Weeks, Master of Sidney Sussex College, in announcing the offer, said, "If the University is able to accept this splendid offer of assistance, not only will the whole cost of building the new library and providing for its maintenance be met, but a new and magnificent opportunity of advancing the physical and biological sciences will be put into our hands."

NOVA SCOTIA

At the annual meeting of the Eastern Counties Branch of the Medical Society of Nova Scotia, which was held at Antigonish in August last, the President, Dr. M. E. McGarry, of Margaree, was in the chair. The afternoon of the first day was given up to papers contributed by Drs. Murphy, Mack, and K. A. MacKenzie, of Halifax, and Dr. W. F. MacKinnon, Antigonish. Members and guests were entertained at dinner by the president, after which the presidential address was delivered and a business session was held. The morning of the second day was given over to clinics at the St. Martha's Hospital. The officers elected are: Honorary President, Dr. George E. Buckley, Guysboro; President, Dr. O. R. Stone, Sherbrooke; Vice-presidents, Drs. R. F. MacDonald, Antigonish, and H. C. S. Elliott, Guysboro; Secretary, Dr. P. S. Campbell, Port Hood.

At a meeting of the Cape Breton Branch of the Medical Society of Nova Scotia, held at the General Hospital, New Waterford, on September 14th, a resolution was passed favouring the use of toxoid as a preventive of diphtheria. It is planned to immunize the school children of Sydney against diphtheria by this means. The meeting at New Waterford was addressed by Dr. Samuel Bell, of New York, who spoke on "Asthma."

Medical men figured quite prominently in the provincial elections held on October 1st. Four of the Conservative, and eight of the Liberal candidates were physicians. Those who offered in the Conservative interests were Hon. Dr. W. N. Rehfuess (Lunenburg), Hon. Dr. B. A. LeBlanc (Richmond), Dr. H. A. Grant (Victoria), and Dr. A. MacD. Morton (Halifax). The Liberal candidates were Drs. J. L. McIsaac (Antigonish), T. I. Byrne and W. J. Kennedy (Halifax), J. W. Reid (Hants), James A. Proudfoot and M. E. McGarry (Inverness), and W. R. Dunbar and D. L. MacKinnon (Colchester). Of these, Drs. Morton, McIsaac, Proudfoot, and McGarry were elected. The dental profession was represented in the contest by Dr. M. E. Morrison, Liberal, (Guysboro), who is one of the successful candidates.

Delay in the reconstruction of the Highland View Hospital, Amherst, has been occasioned by the necessity of obtaining the consent of the citizens to the borrowing by the town of \$40,000.00 to supplement money already on hand. This consent has now been obtained, the plans for the new structure have been accepted, and work has been commenced. A large part of the walls of the old buildings are being utilized, but the interior has been replanned. The reconstructed hospital will accommodate fifty-two patients. Seventy thousand dollars will be expended on the building and twenty thousand in

furnishing it. Pending the completion of the hospital building, the training school for nurses has been disbanded. The work of the hospital is being carried on in houses built for residences, and it was found impossible to suitably accommodate the pupil nurses in the quarters available for them.

Dr. Eva W. Mader, who, since her graduation at Dalhousie in 1927, has been on the medical staff of the Nova Scotia Sanatorium, Kentville, has been awarded a Connaught fellowship in the School of Hygiene, University of Toronto. The fellowship is of the value of \$1,500.00. Dr. Mader intends to proceed to a degree in Public Health. She is a daughter of Dr. A. I. Mader, and a sister of Dr. Victor Mader, of Halifax.

On the twenty-fourth of August, Dr. W. Sidney Gilchrist (Dal., '27), was designated as a medical missionary by the Pictou Presbytery of the United Church of Canada. The ceremony took place at Pictou, Dr. Gilchrist's home town. He has been assigned to Angola, West Africa. Dr. and Mrs. Gilchrist will spend a year in Portugal, learning the language of Angola, before proceeding to their mission field.

John D. Winclose, who poses as a faith-healer, is under arrest at Arichat, charged with an offence against a feeble-minded girl who had been under his treatment for epilepsy.

Action brought by the Federal Department of Health against Rivers Hicks, of Kentville, resulted in the imposition of the minimum fine of \$25.00 and costs. Hicks has been advertising and selling a "cure" for cancer, which, on analysis, was found to be only carbonate of potassium. The charge brought against him was that of selling drugs misbranded, contrary to the provisions of the Drugs Act.

Dr. M. R. Young, of Pictou, recently had a narrow escape from drowning. He had crossed the harbour in a motor boat in response to a sick call, and on attempting to board the boat for the return trip he missed his footing and fell into deep water. The doctor does not swim, and, as it was dark at the time, those in the boat had some difficulty in locating and rescuing him.

Dr. Victor Mader, of Halifax, recently went by aeroplane to Sheet Harbour, to connect there with a Dominion Government ship which had been ordered to proceed to Sable Island and bring a sick wireless operator to Halifax. Dr. Mader, who is a member of the Halifax Aero Club, was accompanied to Sheet Harbour by a fellow aviator, who brought the machine back to Halifax, but the doctor piloted the machine to Sheet Harbour and made the landing there.

Dr. R. M. Benvie, of Stellarton, has gone abroad for six months' graduate study in London and elsewhere.

Dr. C. A. S. McQueen, of Amherst, has returned from a much enjoyed tour of the British Isles and the Continent.

Among those who came to their native province for a holiday this summer were Dr. Henry Dickson, of Ildo, Hawaii, and Dr. J. Clyde MacDonald, of Edmonton.

A class of nurses graduated from St. Martha's Hospital, Antigonish, on the fourth of September. The graduates were addressed by Dr. W. F. MacKinnon.

QUEBEC

The health survey of Montreal, the greatest work of its kind ever undertaken in the Dominion of Canada, was entrusted to men noted in the world of research; men of experience, discernment, precision, and discretion. These men were provided with an adequate and competent staff under the direction of Dr. A. Grant Fleming of the Anti-Tuberculosis and General Health League. The work has involved diligent enquiry and painstaking scrutiny, covering a period of eight months. It was financed by a group of private citizens desirous of contributing to the welfare of the city. When the Metropolitan Life Insurance Company learned of what was being done in this health survey for the benefit of the citizens the directors expressed a desire to print the report and distribute thousands of copies gratuitously. Life insurance companies have a direct interest in increasing the average of the lives of their policy holders, hence their interest in this life survey.

"The United States and Canada lead the world to-day in hospital service," said Dr. F. H. Martin, Director of the American College of Surgeons, prior to making the official announcement of approved hospitals for 1928 at the opening session of the eleventh annual Hospital Standardization Conference. "This is the conclusion reached after eleven annual surveys of the hospitals of both countries by the American College of Surgeons. The right care of the sick and injured has been the slogan of the American College of Surgeons in this work." To the public the announcement of the approved list of hospitals at this season should be one of extreme interest, inasmuch as one out of every ten will need the right kind of hospital care before this time next year. The best assurance for this is in the approved hospital with its ethical, competent, medical staff, adequate facilities for diagnosis and treatment, and competent supervision over all activities. Eleven years ago only 89, or 12.9 per cent, of the hospitals under survey met the minimum requirements for hospital service, as sponsored by the American College of Surgeons and now universally accepted. To-day, after eleven years of effort, 1,919, or 69.5 per cent, have attained a place on the honour roll—the official approved list. Eleven years ago the patient remained in the hospital 20 to 24 days, on the average, whereas to-day he remains only 12 to 14 days in the same hospital for the same condition. The American College of Surgeons officially announced that the following hospitals in Quebec have been awarded a place on the Fully Approved or Conditionally Approved List for 1928, thus signifying that they have adopted the basic requirements which insure the best care of the patient.

MONTREAL.—Alexandra Hospital, 175 beds; Children's Memorial Hospital, 130; Homeopathic Hospital, 112; Hôpital Sainte Justine pour les Enfants, 300; Hôtel Dieu de Saint Joseph, 400; le Miséricorde Hôpital, 380; L'Hôpital Notre Dame, 300; Montreal Foundling and Baby Hospital, 96; Montreal General Hospital, Central Division, 400; Montreal General Hospital, Western Division 125; Royal Victoria-

Montreal Maternity Hospital, 808; Shriners' Hospital for Crippled Children, 60; all fully approved.

QUEBEC.—Hôpital Laval, 260 beds; Hôtel Dieu du Précieux Sang, 252; Jeffrey Hale Hospital, 125; St. François d'Assise Hospital, 100.

SHERBROOKE.—Hôpital Général St. Vincent de Paul, 300; Sherbrooke Hospital, 89.

THREE RIVERS.—St. Joseph's Hospital, 101.

For the purpose of schooling their own nurses in obstetrics, a new maternity ward has been opened at the St. Justine Hospital. Formerly, it was necessary for a number of nurses to leave at times to go to the Miséricorde Hospital in order to study maternity cases. Dr. Gaston de Cotret, formerly of the Miséricorde Hospital, assisted by Dr. A. Groulx, will be in charge. There will be room in Dr. de Cotret's ward for about thirty patients. Dr. J. C. Bernard, Medical Superintendent, stated that the St. Justine Hospital is not changing its policy and admits adults as well as children. "The necessity of giving our nurses a proper training compels us to inaugurate this new section," he said. Since the institution was founded more than twenty years ago, 21,434 children have been admitted to the hospital, 2,437 of whom were treated last year.

The Brehmer Rest Preventorium at Ste. Agathe des Monts has had such a successful year that more than half their patients have been discharged this autumn after a complete cure following treatment. The Brehmer Rest is non-sectarian, with accommodation for women and children only. Cases of incipient tuberculosis, as well as those recovering from operations and serious illness, are admitted as soon as possible after application is made. The small fee charged by those who can pay does not meet the expenses incurred, but the Preventorium is affiliated with the Federated Charities and, as such, has in many cases carried the whole expense, where a patient is unable to pay. Dr. Brehmer founded the first sanatorium in Europe for the treatment of lung disease in 1859 and his name was given to the first Preventorium opened in Ste. Agathe in 1913.

That the science of obstetrics should be given more attention by the medical fraternity the world over, and should be regarded as more the work of the general practitioner than that of a specialist, was the opinion advanced by Dr. Cyrille Jeannin, Parisian specialist, who arrived here recently to give a course of lectures at the University of Montreal. Dr. Jeannin came to Quebec City a short time ago where he lectured at the recent medical convention there. He remained here for another month, then returned to Paris to resume his courses at the Hôpital de la Pitié there. His work here was divided into two sections, clinics and lectures to students in medicine. While here his course was under the auspices of L'Institut Scientifique Franco-Canadien and the University of Montreal. His only public lecture to medical men of Montreal was given at the Cercle Universitaire, the subject being "What is a Doctor?"

The dedication of the Medical Centre in New York, the Diamond Jubilee of the Dalhousie Medical School, and the dedication of the laboratories and hospital of the College of Medicine at Iowa University, are three important medical events that are taking place about this time, and were attended by McGill medical men. Dr. C. F. Martin, Dean of the McGill faculty of medicine represented the university at the dedication of the Medical Centre in New York City; Dr. W. W. Chipman represented McGill at the Diamond Jubilee of the Dalhousie Medical School in Halifax; Dr. Campbell Howard will represent the university at the exercises at the University of Iowa, which take place November 15th and 17th.

The 25th anniversary of the founding of the Association of French-speaking Medical Men of North America was singularly and brilliantly honoured, at a banquet recently held in the Chateau Frontenac, attended by some three hundred delegates to the Association convention, and a distinguished gathering of civic, provincial and clerical officials. Presided over by Dr. P. C. Dagneau, a prominent Quebec physician and President of the Association, the banquet was featured by an address delivered by the President in which he outlined the progress of the Association, the aims and aspirations of its members, and paid great tribute to the founder of the body, Dr. M. D. Brochu, for his untiring efforts in furthering the ideals of the Association. Dr. Dagneau was followed by Dr. Brochu himself, who delivered an extremely interesting discourse wherein he outlined the successes and failures of the founders and original members of the Association during the time when the organization was in its infancy, and complimented the executives of the body on the success of the current convention. In reply to Dr. Dagneau's toast to the Province of Quebec, following the close of Dr. Brochu's address, the Hon. Honoré Mercier, Minister of Lands and Forests, and representative of the Government at the gathering, officially greeted the visiting physicians in the name of the Government, and congratulated them upon the advancement in medical science, due mainly to their efforts in the past few years.

The memory of Dr. William T. G. Morton was honoured by members of the Associated Anaesthetists of the United States and Canada in the little Dome Room of the Massachusetts General Hospital in Boston. On October 16, 1846, Dr. Morton gave the first demonstration of a surgical operation performed with the use of ether. After a visit to Dr. Morton's grave, a bust of the surgeon was presented the hospital by Dr. Francis H. McMechan, Secretary-general of the Association. The bust was unveiled by Dr. William B. Howell, of Montreal, President of the Canadian Society of Anaesthetists; Dr. Albert H. Miller of Providence, R.I., President of the Boston Society; and Dr. John H. Evans, of Buffalo, N.Y., President of the Eastern Society.

What is described as a fine specimen of African negro art, worth several hundred dollars in the art treasure marts of the world, has been given to the Strathcona Museum of McGill University by Sidney Carter, of Montreal. The gift, which was announced by E. L. Judah, curator of the McGill museum, is a wooden mask made by African negroes. The striking thing about it is that the facial features are the exact opposite of those of the negro. A small nose, a small mouth, and small ears set far forward on the side of the skull, are the prominent differences in comparison with the typical negro facial and skull structure.

Dr. A. K. Haywood, Superintendent of the Montreal General Hospital, was presented with a testimonial from the Royal Canadian Humane Association at the Rotary Club luncheon on September 22nd, in the Windsor Hotel.

Rotarian Canon Shatford spoke of Dr. Haywood's conspicuous deed of heroism in rescuing two women, Mrs. Anne Charette and Mrs. L. Clarkson from drowning in Lake Manitou, on August 17, 1927. The certificate was presented with all Rotarians standing.

Pædiatrists of Montreal held a clinical meeting on November 3rd, under the auspices of the Pædiatric Department of McGill University and the teaching hospitals affiliated with the university. The morning was devoted to conferences and in the afternoon living cases were shown. Luncheon was served in the Royal Victoria Hospital and a dinner held in the evening at the Windsor Hotel.

Specially bound booklets, containing one of Sir William Osler's famous addresses, "The Way of Life," were presented to the second year medical students of McGill University by Dr. A. H. Gordon on behalf of Mrs. W. Grant Stewart, who presented similar booklets to the second year medical students last year. In a short address Dr. Gordon paid a tribute to the memory of the late Dr. Stewart by whose bequest the booklets were being given, and briefly reviewed the career of Sir William Osler, one of McGill's most famous graduates and formerly a member of the teaching staff.

We chronicle with pleasure an event of more than local interest when we record that there was unveiled in the University Club of Montreal, on September 26th, a portrait of the veteran physician, Dr. A. D. Blackader, who is one of the Charter Members of the Club and a Past President. The painting is in the best style of the artist, M. Jongers, and depicts Dr. Blackader in his scarlet robes as a Doctor of Laws of McGill University.

Dr. H. S. Birkett, whose remarks were very happy, spoke as follows:

"The duty allotted to me this evening is a great privilege and pleasure, the latter however being considerably marred by the absence through illness of our honoured friend Dr. Blackader. We all much regret his absence and are glad to learn that he is making satisfactory progress.

"There are but two or three of us here present this evening whose privilege it has been to have been companions in his professional journey for part of the time, and I think that we have been able to watch his career with added interest. Our first acquaintance with Dr. Blackader was in the Out-Patient Department of the Montreal General Hospital. Here he was to go forward, putting into practice the work of his specialty, the foundations of which had been laid by extensive study in the hospitals of Great Britain and Europe, and in his clinics one saw his application of the humanities, in the care and consideration for his patients in all walks of life. The poor received the same kindly and courtly attention that he gave the rich. In this department of the Montreal General Hospital his knowledge was broadened and deepened and led to the production of scientific and literary work of such a high character that he became recognized as a great leader in his specialty and his efforts were recognized by leading Societies in Great Britain and the United States conferring distinction and honours upon him. These attainments were also recognized in his own country and by his Alma Mater, the latter conferring upon him the honorary degree of LL.D. Thus, each milestone of his professional life has been marked by a distinct incident and now the members of the Club have also recognized his service to it as an original member and Past President by having his portrait painted by a very distinguished artist, M. Jongers, which acquisition will long serve to remind us of a kind and courtly gentleman and a beloved physician."

GEORGE HALL

Professor W. W. Chipman of McGill University, was granted the degree of Doctor of Laws *honoris*

causa, at the recent convocation of Dalhousie University.

Promotions in the Faculty of Medicine at McGill University include the following: Dr. F. H. Mackay, from lecturer to clinical professor of neurology; Dr. J. A. Nutter, from lecturer to clinical professor of orthopaedic surgery; Dr. H. M. Little, from assistant professor to clinical professor of obstetrics and gynaecology; Dr. J. R. Fraser, from lecturer to clinical professor of obstetrics and gynaecology; Dr. H. C. Burgess, from lecturer to professor of gynaecology and obstetrics; Dr. J. R. Goodall, from lecturer to clinical professor of obstetrics and gynaecology; Dr. J. W. Duncan, from lecturer to clinical professor of obstetrics and gynaecology; Dr. E. Hamilton White, from demonstrator to lecturer in otolaryngology; Dr. A. W. Young, from demonstrator in neuro-pathology to lecturer in neurology; Dr. W. J. Patterson, from demonstrator to lecturer in orthopaedic surgery.

Dr. J. A. Wright has been appointed Research Fellow in Pathology in the Faculty of Medicine, and

Dr. P. J. Kearns, Clara Law Fellow in Obstetrics and Gynaecology.

Drs. R. R. Fitzgerald, Dudley E. Ross, H. M. Elder, and P. G. Silver, have been appointed demonstrators in anatomy, while Dr. G. G. Miller, has been appointed an assistant demonstrator in surgery. Those appointed to be assistant demonstrators in pathology are: Drs. Neil McLeod, John E. deBelle, A. W. Blair, George D. L. Taylor, P. N. MacDermot, and G. N. Paterson-Smyth.

Major James Stevenson has been promoted to the rank of lieutenant-colonel and placed in command of No. 6 Stationary Hospital, C.A.M.C., Quebec. During the war, he was officer in charge of the Quebec Military Hospital.

Captain A. E. Lundon has been promoted to the command of No. 6 Field Ambulance, C.A.M.C., in succession to Colonel S. H. McKee, C.M.G., who is appointed to the command of No. 6 Reserve Field Ambulance.

ONTARIO

The opening meeting of the Academy of Medicine, Toronto, took place on Tuesday, October 2nd. According to the general custom this, the president's meeting, was preceded by the annual dinner, a dinner at which more than two hundred of the Fellows were present. There were many guests, including Sir Samuel Squire Sprigge, the Editor of *The Lancet*, Mr. Keyne of Barts, Dr. Hugh Thursfield, Sir Robert Falconer, and the chairman of the various hospital boards, all of whom contributed to the dinner by their timely remarks, remarks which dealt largely with the problems of post-graduate education in London. Towards the end of the dinner the many friends of Dr. Marlow, the President, were delighted to see him appear after his long illness and absence, and were especially pleased that he was able to make a few remarks before leaving. Dr. W. Warner Jones, Vice-president, acted as chairman at the dinner, and presided at the stated meeting, later. After the introductory remarks by the Vice-president, Dr. H. B. Anderson, Chairman of the Board of Trustees presented a report which outlined the future policy of the Academy. In this report the Fellows were reminded that the question of a new building would have to be met in the very near future. Details of finance and of building plans were brought forward, and, as the report indicated, it is quite evident that the greatest of the forward steps of this progressive institution is in process of being made. Drs. Andrew Eadie, George H. Bowles, and George Balmer were elected to Life-fellowship. The election of the representatives of the Academy upon the Committee on General Purposes of the Ontario Medical Association took place. The address of the evening was given by Dr. Hugh Thursfield, St. Bartholomew's Hospital, London, England, who took as his subject, "The thymus gland and so-called thymic asthma."

The Section of Medicine met on Tuesday, October 9th. After the chairman's address, the following papers were presented: "Relation of the altitude of the sun to its antirachitic effect," by Drs. F. F. Tisdale, and Alan Brown; "Cases of subacute bacterial endocarditis," by Dr. Harris McPhedran.

District Number Five of the Ontario Medical Association met in Barrie, October 3, 1928. The following program comprised the day's meeting. "Factors contributing towards reduction of surgical

failures," by Dr. J. K. McGregor, Hamilton; "A review of the Medical and Narcotic Drug Acts, with some difficulties arising out of their attempted enforcement," by Dr. E. A. McQuade, Trenton, President of the Ontario Medical Association; "Hypertension," by Dr. Geo. S. Young, Toronto; "Some aspects of the prostatic problem," (lantern slides), by Dr. F. S. Patch, Montreal.

Addresses were also given by Dr. R. T. Noble, representing the College of Physicians and Surgeons of Ontario, and Dr. T. C. Routley, Secretary of the Ontario Medical Association.

A short business session was held at which Dr. W. A. Lewis of Barrie was nominated Counsellor of the District for the ensuing year, and Dr. S. W. Otton of Newmarket was elected Vice-counsellor. Considerable interest was displayed in the problem of the drug addict, and a resolution was passed with the unanimous approval of the meeting, memorializing the provincial government to provide adequate hospital accommodation for drug addicts, and also to make provision for their committal thereto.

It was the unanimous opinion of all those present that this meeting was a decided success and one of the best ever held in the District.

Little by little the general plan of the new St. Michael's Hospital is taking form, and this splendid institution, the equal of any of its size in Canada, is appearing as a compact new building able to accommodate six hundred patients. The latest addition, a seven story building, is fireproof, and with its light halls, bright wards, well equipped diet kitchen is unsurpassed. It is a remarkable addition to Toronto's hospital accommodation. There are no fewer than seventy-five private rooms, and almost an equal number of semi-private, and in connection with them there are eight operating rooms, together with a new emergency ward and its equipment. The broad-minded attitude of the trustees and managers is seen in the generous provision for laboratories; a whole floor is given over to the x-ray department; and another floor is provided for the clinical laboratories, which to an observing eye seem as complete in their equipment and as extensive in their space as any of the best on the continent. When one adds to this detail the fact that these laboratories are under the supervision of a

pathologist such as Dr. Magner, one realizes that St. Michael's is determined to maintain its high standard of efficiency. With its equipment, with its professional staff, and with its capable and managing sisterhood, St. Michael's in its new surrounding stands far forward in the ranks of Canadian Hospitals.

N. B. GWYN

The Ontario Neuro-Psychiatric Association will meet at the Psychiatric Hospital, Toronto, on November 16th. A business meeting will be held from 5 to 6 o'clock and papers, clinical demonstrations and discussions will begin at 8.30 p.m.

G. C. KIDD,
Secretary

MANITOBA

The epidemic of poliomyelitis, which began in Winnipeg in July, reached its peak in August and spread to other points in Manitoba, but by the end of the first week in October it had subsided, and it is expected that few if any further cases will be reported for the balance of the year. Up to October 7th, 395 cases were reported; 250 from Winnipeg and 145 from other Manitoba points, with a total of 28 deaths. The Winnipeg schools which were to have opened on September 4th did not open until October 1st. Convalescent serum was used extensively, with excellent results if given before the onset of paralytic symptoms. Great praise must be given to the Medical Research Committee, which directed the collection and distribution of serum, and to the Winnipeg Medical Society, which was responsible for calling an emergency meeting of the profession and appointing a committee that prepared valuable articles on the diagnosis and treatment of the disease for the public press. The work of these two bodies created a certain feeling of security in the minds of the lay public and prevented any panic. The Medical Research Committee is now engaged in preparing a report on this epidemic and the effect of convalescent serum therapy and this report when presented will undoubtedly be of considerable value. By months the number of cases reported and the deaths are as follows:—

	Winnipeg		Rural and Suburban Manitoba	
	Cases	Deaths	Cases	Deaths
July	9	3	1	0
August	79	9	21	4
September	154	7	111	5
Oct. 1-6	8	0	12	0
(inclusive)	—	—	—	—
Total	250	19	145	9

It should be borne in mind in connection with the deaths assigned to Winnipeg that these may include non-residents of the city who were brought to city hospitals for treatment.

The contract for the building of the first wing of the Deer Lodge Military Hospital, on the outskirts of Winnipeg, was awarded on September 21st, the estimated cost being \$131,571. The wing will be built on the east side of the present building and will provide wards for bed patients. It will be three storeys in height and will have a recreation floor on the roof.

On October 2nd, at the Metropolitan Theatre, Winnipeg, and under the auspices of the Winnipeg Medical Society, Dr. James Miller, Director of the Richardson Laboratories, Queen's University, Kingston, showed the

The department of Anatomy of the University of Western Ontario, London, has been re-organized by its Professor and Chief, C. C. Macklin, F.R.S.C. Dr. H. Alan Skinner, M.B. (Tor.), has been appointed Assistant Professor of Anatomy, and E. N. Ballantyne, B.A., M.D., M.Sc., Carl G. Smith, B.A., and W. K. Welsh, M.B. (Tor.), are full-time instructors. The part-time instructors are H. M. Simpson, M.D., M.Sc., F.R.C.S. (Edin.); Hermann E. Schaefer, M.D.; Leonard W. Pritchett, M.D.; R. A. Johnston, M.D.; H. O. Foucar, B.A., M.D.; and Madge Thurlow Macklin, A.B., M.D. (Johns Hopkins). Messrs. Calder, Gilchrist and Rogers are student assistants.

intensely interesting Canti film. This film which has been presented by Dr. R. G. Canti to the Canadian Medical Association, depicts normal cell reproduction and the effects of radium on cancer cells. A large audience was present.

At the regular monthly meeting of the Winnipeg Medical Society, held on September 21st, Dr. N. J. Maclean presented a paper on "Tumours of the upper left abdomen," Dr. Geo. V. Bedford spoke on "Thallium therapy in ringworm of the scalp," while Dr. M. J. Ormerod discussed "The pharmacology of thallium." Dr. A. W. S. Hay was elected to membership.

The seventeenth annual meeting of the Canadian Public Health Association was held in the Royal Alexandra Hotel, Winnipeg, on October 11th, 12th, 13th, with Dr. Geo. D. Porter, of Toronto, presiding.

The Winnipeg Health League, under the able leadership of Dr. H. M. Speechly, has prepared an imposing list of speakers to address audiences during the coming winter and spring. The subjects to be presented cover a wide field and fall into three groups: (a) to parents and adults interested in child training; (b) to general audiences; and (c) to adolescents. The addresses will be given not only at meetings directly under the auspices of the Winnipeg Health League but to service clubs, women's organizations, and others, and in addition radio talks of one-half hour duration will be given.

In the Manitoba University Alumni Golf Tournament, held at Southwood on October 5th, Dr. W. D. Mann won the men's low gross score. The low net ended in a tie between Dr. G. S. Fahrni and W. A. Lendal of Law. Medicals won the inter-faculty team match. The ladies low gross score was won by Mrs. (Dr.) G. B. McTavish.

Dr. C. W. Duncan has opened an office in Winnipeg.

The contract for the building of Mount Carmel Clinic at Austin Street and Selkirk Avenue, Winnipeg, has been awarded.

ROSS MITCHELL

At the last meeting of the Executive of the Manitoba Medical Association, the following were appointed to the Editorial Board of the *Canadian Medical Association Journal*, as representing Manitoba: Dr. Ross Mitchell, (Chairman); Dr. H. M. Speechly, (Secretary); Dr. C. R. Gilmour; Dr. L. D. Collin; Dr. J. D. McEachern.

SASKATCHEWAN

Dr. R. O. Davison, Director, Division of Communicable Disease, Department of Public Health, Saskatchewan, addressed the regular monthly meeting of the Regina and District Medical Society, September 5th, on "Immunization and serum treatment." This interesting and instructive paper provoked much discussion.

Dr. M. M. Seymour then addressed the meeting on "Health districts in Saskatchewan." A summary of this is found elsewhere in this *Journal* (p 598). The meeting expressed its appreciation of the work done in the province in disease prevention by the department and hoped to co-operate in this work.

Dr. W. A. Dakin was elected a delegate to the annual meeting at Prince Albert. Dr. H. H. Mitchell was appointed representative to the executive of the Saskatchewan Medical Association for the coming year.

The Society recommended to the Junior Red Cross committee that a doctor be appointed as house physician to the Junior Red Cross Hospital.

The epidemic of poliomyelitis in Manitoba was discussed with a view to preparedness in case the disease spread to the Regina district. The meeting passed a resolution requesting the Department of Public Health to get the consent of patients or of the parents of junior patients who have had poliomyelitis to collect blood for the purpose of manufacturing convalescent serum if it is found necessary.

Dr. Harvey Agnew, Associate Secretary of the Canadian Medical Association and Secretary of the Department of Hospital Service, addressed the Annual Meeting of the Regina and District Medical Society, which was held on October 4th.

Dr. Henry gave a short résumé of his trip to Europe, where he visited the different men engaged in x-ray and therapy work in the various centres, London, Manchester, Edinburgh, Paris, Munich, Vienna and Berlin; and attended the Second International Radiological Congress in Stockholm.

Among the interesting work seen was that of Dr. Bœclère, of Paris, who kindly demonstrated intra-uterine technique, with the use of lipiodol under pressure, and illustrated his cases with lantern slides.

A very interesting and instructive week was spent at Vienna, under the supervision of Dr. Schuller. At the Convention at Stockholm a few of the many interesting cases were mentioned, special stress being placed upon the papers which gave a description of treatment of psoriasis, and also the treatment of asthma by x-rays.

Before proceeding to the business meeting the members rose and observed a moment's silence in honour of the late Dr. F. J. Ball who had been a former president of the society.

Dr. B. C. Leech was appointed house physician to the Junior Red Cross Hospital, Regina.

The matter of a Victorian Order nurse for Regina was discussed briefly and left for the incoming officers to deal with.

Dr. S. E. Moore, Treasurer, gave his report, which was accepted. The election of officers resulted as follows: Hon. President, Dr. M. M. Seymour; President, Dr. R. O. Davison; First Vice-president, Dr. W. A. Dakin; Second Vice-president, Dr. R. R. Roger; Secretary, Dr. P. L. Straith; Treasurer, Dr. S. E. Moore; Executive, Drs. J. C. Black, J. B. Ritchie, S. Kraminsky, W. A. Harvie, and G. H. Sahlmark.

The President, Dr. H. H. Mitchell, gave a short review of the very satisfactory year's work. There were ten regular meetings and three meetings visited by

post-graduate teams. He thanked the members for their active and harmonious support. P. L. STRAITH

The third annual convention of the Saskatchewan Health Officials' Association was held at Saskatoon on October 9th at the King George Hotel.

After the President's address, by Dr. H. C. Burroughs, of Swift Current, the following scientific papers were given: "Restricted areas for tuberculin testing, and their relation to public health," by Dr. C. J. Johannes, Veterinary Inspector, Health of Animals Branch, Dominion Government; "Inspection of food places," by Mr. H. G. Buck, Food Inspector, City Health Department, Saskatoon; "How foods are tampered with," by Mr. E. G. Southon, Sanitary Officer, Swift Current.

In the afternoon the following papers were read: "The relation of the sun to general health," by Dr. John Orr, Saskatchewan Anti-Tuberculosis League; "Public health nursing," by Miss Ruby Simpson, R.N., Assistant Director, Division of Public Health Nursing, Department of Health, Saskatchewan; "Communicable diseases," by Dr. R. O. Davison, Director, Division of Communicable Diseases, Department of Public Health, Saskatchewan; "Problems of the rural health officer," by Dr. A. O. Rose, M.H.O., Hafford; "Some of the difficulties of the part-time health officer," by Dr. J. H. Jackson, M.H.O., North Battleford; "The city medical health officer," by Dr. W. R. Coles, Regina.

The round table discussion at 4.30 p.m. was led by Dr. Arthur Wilson, M.H.O., Saskatoon.

After dinner addresses were given by Hon. J. M. Uhrich, M.D., Minister of Public Health, by Dr. M. M. Seymour, former Deputy Minister of Health, now Special Adviser on Public Health to the Saskatchewan Government, and by Dr. MacLeod Harris, Chief of Laboratory and Hygiene, Department of Pensions and National Health, Ottawa.

At the business meeting which was held in the evening the officers for next year were elected as follows: Patrons, His Hon. Lieut-Governor H. W. Newlands, Hon. J. G. Gardner, Premier, Hon. J. M. Uhrich; Honorary President, M. M. Seymour, M.D., D.P.H.; President, J. H. H. Jackson, M.D., M.H.O., North Battleford; Vice-President, W. R. Coles, M.D., M.H.O., Regina; Executive: Ruby M. Simpson, Regina; Paul McElmoyle, Regina; W. H. Orme, M.D., Saskatoon; D. R. Davies, M.D., M.O.H., Estevan; B. M. Bayley, M.D., M.H.O., Moose Jaw; R. G. Ferguson, M.D., Fort Qu'Appelle Sanatorium; H. C. Burroughs, M.D., M.H.O., Swift Current.

Speakers from Saskatchewan at the Canadian Public Health Association Convention held at Winnipeg, on October 11th, 12th and 13th, were Dr. Arthur Wilson, M.H.O., Saskatoon, on "The authority of the medical officer of health in his own community"; R. H. Murray, Director, Division of Sanitation, Department of Public Health, Saskatchewan, on "The Control of public milk supplies"; Dr. F. C. Middleton, Acting Deputy Minister of Health, Saskatchewan, on "The movement toward full-time Health units in Saskatchewan" and "The periodic examination as a public health measure"; Miss Marion Lindeburgh, R.N., on "Health teaching in high schools."

The following Saskatchewan representatives were elected on the Executive Council: Dr. Arthur Wilson, Saskatoon; Dr. J. H. H. Jackson, North Battleford; Dr. F. C. Middleton, Regina.

Dr. H. H. Hepburn, F.R.C.S., of Edmonton, and Dr. W. H. Merritt, of Calgary, toured Saskatchewan in October giving post-graduate lectures to the local societies. They were guests of the Regina General Hospital at lunch on October 19th, at which time they spoke on "Encephalitis" and "The surgical treatment of neuritis." At the evening meeting, after a dinner at the Hotel Saskatchewan, Dr. Hepburn spoke on "Treatment of head injuries," and Dr. Merritt spoke on "Peptic ulcer." They were accompanied by Dr. A. MacG. Young, Secretary of the Saskatchewan Medical Association.

The School Hygiene Branch of the Department of Education was organized in April, 1917, with a staff which has gradually increased to fourteen nurses. All of the 4,770 organized districts have been visited by

school nurses; some of them have been visited four or five times. Correction of the remediable defects by the family physician has been vigorously sought. The teaching of health in the schools has been carried on. Saskatchewan was the first province in Canada to introduce health education in the Normal Schools, directed by public health nurses with teaching backgrounds.

On May 1, 1928, the School Hygiene Branch of the Department of Education was transferred to the Department of Public Health, and, associated with the nurses who are already in the Department of Public Health, will in future be known as the Division of Public Health Nursing. The object of merging the two branches was to unify the service and avoid duplication of effort. A plan of generalized public health work has been arranged with special districts allotted to each of the sixteen nurses now in the field.

ALBERTA

The September meeting of the Academy of Medicine, following the summer vacation, was held at the summer residence of the President, Dr. J. F. Folinsbee, seven miles from Edmonton centre, overlooking the Saskatchewan River. Some sixty of the members of the Academy were present and a discussion took place in reference to (1) the report of the committee on the proposed Medical Arts building in the city, similar to that already established in the city of Winnipeg; (2) the disposition of the library of the Academy of Medicine, the final decision here being made to make a gift of it to the Medical Library of the University of Alberta, the books to be available for the use of all medical men of Alberta. Following the meeting a very enjoyable buffet luncheon was served in the billiard room, a most enjoyable time being spent partaking of the hospitality of our genial President.

Dr. G. E. Swallow has recently been appointed Assistant Medical Inspector of Schools, on part time, by the Edmonton School Board. T. H. WHITE LAW

In the new form of Application for Registration in Alberta, provision is made for a certificate of character from registrars in other districts where the applicant has practised. The idea is that Alberta is no longer the "wild and woolly west" to which a man may go after conducting himself in a manner unworthy of his profession, and expect to be received with open arms. Alberta intends that future registrants who are "wanderers" shall show good reasons for their acceptance.

The following have just registered in Alberta: Dr. Robert Fraser Stewart, Coleman; Dr. Arthur Wycliffe Scott, Calgary; Dr. Harold Warnica Price, Calgary; Dr. Elgar Emrys Evans, Calgary.

Through the courtesy of the Canadian Medical Association Dr. Canti's film, "Growth of Tumour Cells in Vitro" was exhibited in the Palace Theatre, Calgary, by Prof. James Miller of Queen's University, Kingston. In addition to the local medical men, the following were invited to view the film; newspaper

editors, dentists, druggists, the legal profession, the Ministerial Association, school teachers, and nurses. The theatre was well filled and general delight and approval was manifested by all.

Calgary regrets exceedingly that one of the "real old-timers" in the practice of medicine should have been transferred to Vancouver, in the person of Dr. R. D. Sanson, and the fact that his new appointment is a promotion only lightly affects the general feeling of regret.

Dr. E. A. Johnson, a recent graduate of Alberta University, has purchased the practice of Dr. DeBeaupré, of Fort Saskatchewan, and is already at work.

Dr. Edward G. Hollies, of Edmonton, has taken over the practice of Dr. Huckell at Waskatenau, the latter going to the University Hospital as assistant to Dr. Mewburn in orthopaedic surgery.

Dr. H. C. Swartzlander has disposed of his practice in Oyen and is moving to Calgary. Dr. S. R. McGregor, formerly of Red Deer, is succeeding him.

Dr. W. W. Nasmyth, of Sylvan Lake, suffered a severe loss in the death of his wife recently, and his many friends extend their heartfelt sympathy to him at this time.

Dr. James Kenny, of Retlaw, has just returned from a three months' internship in Buffalo Hospital, and is intending to remain in Alberta.

Dr. George R. Johnson, Registrar, has gone to Halifax to attend the 75th Anniversary of the Nova Scotia Medical Association. He will give a lecture on early medicine in Alberta. On his way to Halifax he will do some post-graduate work.

Dr. Katherine M. Hick; M.R.C.S. Eng., has accepted an appointment in the Municipal Hospital, Onoway, Alta. W. G. HUNT

BRITISH COLUMBIA

The winter session of the Vancouver Medical Association was opened on Tuesday, October 2nd, with papers by Dr. J. J. Mason on "Genital prolapse," and "The technique of version" by Dr. W. B. Burnett. The first of the season's business meetings was held prior to the scientific papers. The report of the Summer School, held in June, 1928, was given by the Chairman, Dr. H. R. Stoops, who reported a substantial balance to the credit of the School in the funds of the Association. Dr. Wilfrid L. Graham and Dr. R. P. Kinsman were elected to serve on the committee of the Summer School for the next three years. Assistance has been rendered to the committee during the past three years by the Canadian Medical Association in supplying some of the speakers. For 1929 it is possible the committee may adopt a different policy, with regard to obtaining speakers in other ways. Eight new members were elected by the Association; Drs. A. M. Agnew, E. E. Day, W. L. Graham, W. H. Hatfield, C. T. McCallum, D. M. Meekison, H. R. Mustard, and J. Eden Walker, bringing up the total membership to 221.

Several of the younger members of the Association have recently formed a reading society under the proposed title of "The Osler Society of Vancouver." Meetings will be held monthly, and at each meeting two papers will be given, the discussion on which will be led by one of the older members of the Association who will be invited to attend the meeting. It is hoped that free discussion will lead to full attendance at each meeting.

It is anticipated that the new Private Ward Wing of the Vancouver General Hospital will be opened in the near future. Furnishing is now under way and the new beds will probably be ready for occupation earlier than was anticipated. The new maternity wing is also nearing completion.

In view of the pending amalgamation of the adjoining municipalities with Vancouver, and the consequent changes that will be necessary in the Health Department, the Vancouver Medical Association, on a motion by Dr. A. S. Monro, recently appointed a committee to make a public health survey of the proposed greater city of Vancouver. The committee is busy investigating and a full report is promised for the November meeting of the Association.

The fourth extra-mural post-graduate tour throughout British Columbia has just been completed and it will be interesting to the Canadian Medical Association and the Sun Life Assurance Company to know that it was an unqualified success. Lectures were given at Cranbrook, Grand Forks, Kelowna, Vancouver, Chilliwack, Nanaimo, Victoria, Prince Rupert and Prince George. Outside the larger centres of Vancouver and Victoria tremendous mileage was covered by the doctors in their anxiety to attend the meetings, and this, plus the enthusiasm and the keen appreciation of the addresses must have been gratifying to the distinguished speakers selected for us.

It was indeed an honour to have Dr. A. T. Bazin and Dr. A. H. Gordon, of McGill University, and Dr. Gordon Bates, of Toronto, with us. Dr. Theo. H. Lennie, Vice-President of the British Columbia Medical Association and Dr. Howard Spohn accompanied the speakers on their tour. The annual meetings of the East Kootenay, West Kootenay and Okanagan Medical Societies were held concurrently with the

post-graduate meetings. Dr. F. W. Green, of Cranbrook, was elected President of the East Kootenay Society; Dr. H. H. McKenzie, of Nelson, President of the West Kootenay; and Dr. A. L. Jones, of Revelstoke, President of the Okanagan Medical Society.

Dr. W. L. Graham and C. H. Bastin have been appointed the representatives for British Columbia on the Editorial Board of the Canadian Medical Association.

We welcome home our Executive-Secretary, Mr. C. J. Fletcher, who has just returned from the Mayo Clinic and hope he will soon be his genial self once more.

Dr. W. E. Tiffin of Kimberley has taken over the practice of Dr. D. Wannop, Nanton, Alberta.

Dr. J. A. Ireland has been appointed Medical Officer at Atlin, B.C.

Dr. C. R. Marlatt has resigned the position of Medical Superintendent of the Powell River Sick Benefit Society, effective on December 1st. Dr. Marlatt, who has been practising in Powell River for the last nine years, will continue there in private practice. Dr. A. S. Underhill is acting as his assistant.

W. L. GRAHAM

Dr. J. A. Stewart, eye, ear, nose and throat specialist, of Victoria, is now en route to Vienna, where he will do post-graduate study in his specialty.

Dr. F. M. Bryant of Victoria is now back in practice, following a successful operation.

Dr. E. M. Casey of Montreal and Dr. J. R. Lingley of Harvard are now at the Royal Jubilee Hospital, Victoria, as internes.

The Victoria Medical Society held a dinner on September 7th, when Dr. A. T. Bazin and Dr. A. H. Gordon of Montreal, and Dr. Gordon Bates of Toronto were the guests of honour, and addressed the members. Dr. Bazin dealt with "Some diseases of the gall bladder" and Dr. Gordon read a paper on "Nephritis" following which Dr. Bates addressed the society dealing with the control of venereal disease when he was able to show convincingly the magnitude of the problem confronting the profession. On September 8th, Dr. Bazin addressed the members after luncheon at the Union Club his subject being "Varicose veins." In the evening Dr. Gordon read a paper on "Digitalis therapy" and Dr. Bazin dealt with "Inguinal hernia." Dr. Gordon Bates showed some very interesting lantern slides. At the close of this evening a vote of thanks was passed to the three visiting speakers on motion of Dr. George Hall. The Society was very fortunate in having two days so pregnant with instruction and was especially grateful to Dr. Gordon Bates for giving two public lectures on "Preventive medicine." These lectures were well attended. The arrangements were carried out by Dr. M. G. Thomson who is now in British Columbia organizing and carrying on the program of the National Social Hygiene Council.

C. H. BASTIN

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A Gift for Radium

A gift of \$100,000, from Col. Louis J. Kolb, of Germantown, has been received by the Graduate Hospital of the University of Pennsylvania and the Department of Radiology of the University's Graduate School of Medicine. It is intended for the purchase of a gram of radium and the accessories for use in the treatment of cancer. About \$72,000 will be required for the purchase of the radium, and the balance will be applied to the expenses involved in the special clinical and medical work. Col. Kolb's gift is the second to be received by the University within the last ten months for the control of cancer, Mr. I. DuPont having donated \$45,000 last December. As a result of Mr. DuPont's gift a study of the physico-chemical conditions associated with the cancer state is being made, under the direction of a committee consisting of Drs. Ellise McDonald, W. C. Sefriz, and Dean Meeker.

Sir Robert Philip

Sir Robert Philip, of Edinburgh, who established the first Tuberculosis Dispensary in 1887, and developed the Edinburgh System of Tuberculosis Control, was awarded the Trudeau Medal at the recent annual meeting of the National Tuberculosis Association. Sir Robert is the first foreign physician to be so honoured.

National Tuberculosis Association

At the annual meeting of the National Tuberculosis Association, held recently in Portland, Ore., Dr. Eugene L. Opie, of the Henry Phipps Institute, Philadelphia, was elected President, and Dr. Ray W. Matson, of Portland, Vice-President.

New York Academy of Medicine

The Bulletin of the New York Academy of Medicine for August contains the list of the recent Harvey Exhibit, planned and arranged by Dr. Archibald Malloch, Librarian, and shown in the library of the Academy.

GENERAL

Medical Council of Canada

At the recent examinations of the Council, held in Montreal and Winnipeg, the following candidates were successful: A. Aubry, Lancaster, Ont.; C. G. Bain, Tofield, Alta.; M. M. Baird, Fredericton, N.B.; D. M. Baltzan, Brooklyn, N.Y.; A. W. Blair, Regina; F. W. Boyd, Winnipeg; J. L. Brown, Regina; R. F. Brown, Toronto; J. B. Cramer, Westbrook, Ont.; P. E. Doyle, Hawkesbury, Ont.; J. R. Forrest, Montreal; R. Gottlieb, Vienna, Austria; N. L. Higginbotham, Lethbridge, Alta.; L. Jordani, Winnipeg; R. H. Kinsman, Toronto; S. W. Leiske, Seattle, Wash.; K. M. Lindsay, London, Ont.; Muriel MacLennan, Westmount; H. McKenzie, Dunganon, Ont.; E. M. McLean, Port of Spain, Trinidad; R. B. Michener, Wichita, Kan.; J. Mindess, Winnipeg; J. A. Murison, Kindersley, Sask.; F. J. Murphy, Red Deer, Alta.; E. B. Potts, St. Thomas, Ont.; E. Prefontaine, St. Pierre, Man.; E. L. Reid, Scotland; A. Scharf, Moose Jaw; L. Sinotte, Ottawa; D. Stredig, Elora, Ont.; J. B. Thompson, Orono, Ont.; J. G. Toombs, Mt. Stewart, P.E.I.; W. M. Wallace, Toronto; J. E. Whitworth, Vancouver; J. W. Walton, Ayr, Ont.

These physicians are now registered as of date October 12, 1928.

Professor v. Müller

The seventieth birthday of Geheimrath Prof. Friedrich v. Müller, of Munich, who, it will be remembered, visited Canada some twenty years ago and lectured in various cities, was celebrated on September 19th. The auditorium of the Second Medical Clinic in Munich was too small to accommodate the crowds of his former students and his friends who flocked there. Professor Martini spoke on behalf of the students words of admiration and affection, and presented a bronze bust by Weckbecker, subscribed for by the students. Professor Stachelin, of Basel, spoke for the old pupils and the Medical Faculty of Basel, presenting Prof. v. Müller with a beautiful casket containing photographs of former students and friends. The Minister of Education, Herr Goldenberger, represented the Bavarian Government and Dr. Schüpfer, the Rector, spoke for the University of Munich.

Prof. v. Müller thanked the various speakers feelingly and in appropriate terms. His word to the physicians was—to keep themselves always free and independent.

Book Reviews

Diseases of the Gall Bladder and Bile Ducts. Evarts Ambrose Graham, A.B., M.D., Warren Henry Cole, B.S., M.D., and others. 477 pages, 224 illustrations. Price \$8.00 net. Lea & Febiger, Philadelphia, 1928.

The main reasons given in the preface for the publication of this book are "the growing realization of the frequency and of the importance of diseases of the biliary system" and the fact that "no comprehensive discussion of this subject has appeared in the English language since Rolleston's classical work was published in 1905."

Both of these are thoroughly sound but the authors rather lay themselves open to criticism for gross exaggeration when they state that "approxim-

ately 40 per cent of our adult population have disorders of their biliary systems." If all other causes of ill health were added to this high percentage, it is amazing how the work of the world can be carried on as it is. Possibly the enthusiast in his subject may be excused to a degree for being carried away in this way, as well as for the prominence which is given throughout the book to cholecystography, for the discovery of which the author is responsible.

In a general way, the objective of giving a systematic outline of biliary diseases has been very successfully accomplished. The complete review of the recent advances and researches fills a much needed place in the book literature on this subject, about one-third of the book being devoted to experimental

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NOVA SCOTIA MEDICAL BULLETIN, AUGUST, 1928.

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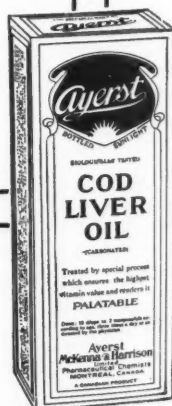
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and clinical cholecystography and to the discussion of the various tests of hepatic function.

In discussing the anatomy of the biliary system, the importance of the lymphatics is fully described and excellent plates show the variations in the arteries and ducts of the biliary tract. The authors have succeeded in presenting a fair evaluation of the present knowledge of the functions of the gall bladder, but no mention is made of the normal relation of the flow of the bile into the duodenum in its relationship to the cycle of digestion, overlooking the fact that the biliary is an accessory part of the alimentary system.

The chapters on symptoms and clinical diagnosis are entirely inadequate in a work that professes to cover this whole subject. The practitioner will gain little help in the diagnosis of cases of disorders of the biliary tract, as the descriptions of the symptoms, *e.g.*, of indigestion, give little idea of their characteristic features. Resort is made to quoting statistical frequency of certain symptoms, but the clinical course of the many types of cases that occur receives little attention. One is almost forced to the opinion that the bedside study of cases has failed to interest the authors to the same degree as the laboratory research work and the literature. The discussion of the problems of diagnosis likewise point to a similar conclusion, when it opens with the differentiations of visceroptosis, spastic constipation, and intestinal allergy, but scarcely mentions such common sources of difficulty as duodenal and gastric ulcer and carcinoma, and lesions of the appendix and kidney. The clinical differences in the pathological processes that simulate chronic cholecystitis and cholelithiasis have failed to find a place.

The surgical treatment is well described and illustrated, but the practitioner receives but few suggestions in the methods of handling cases before they reach the stage when operation is clearly indicated.

The book is well published and the illustrations are well reproduced. More pictures of pathological gall bladders and the types of gall-stones, with fewer of laboratory tests, would have filled a much needed want. The book as a whole will prove an exceedingly useful one for both the student and practitioner, more especially from the point of view of the recent experimental investigations that have been conducted. It will help to fill the gap between 1905 and the present, but still leaves room for an author of wide clinical and pathological experience and an appreciation of research, to write an evenly balanced monograph on this increasingly popular subject.

E. G. RYERSON

Epilepsy. Medicine Monograph No. XIV. William G. Lennox and Stanley Cobb. 197 pages, illustrated. Price \$3.50. Williams & Wilkins Co., Baltimore, 1928.

The scope of the book has been carefully confined to "the presentation of evidence which may throw light on the mechanism involved in seizures: and on the cause and treatment."

The authors first give briefly and clearly the different theories commonly held as to the neurological mechanisms of convulsions. The next and major portion of the work is devoted to a consideration of the different factors which may or may not cause convulsions. The last section contains a short review of modern methods of treatment. These three aspects of the problem presented by epilepsy have been condensed, but adequately discussed, within the compass of some one hundred and fifty pages. The authors have evidently reviewed the existing literature very exhaustively and have presented the evidence for varying views and theories, including their own, con-

servatively and impartially. The very large and complete bibliography attached to the work allows the reader to take advantage of what has quite evidently been a very careful and laborious search of the literature. Each section is closed with a short summary of the matters discussed therein and this together with the fact that the book is written in clear concise English enables one to read it in one evening without that sense of fatigue that is so often experienced when perusing medical literature.

E. C. MENZIES

New and Nonofficial Remedies, 1928. Published by the American Medical Association, Chicago. Price \$1.50.

No official pharmacopœia can be expected to deal with all the additional remedies which are continually appearing. And yet it is well known that many of these remedies are of great value. It is also well known however that many remedies offered for sale have little or no value. It is to fill the gap in the official viewpoint regarding these two classes of remedies that the Council of Pharmacy and Chemistry of the American Medical Association publish each year a volume which lists and describes the articles accepted by them as worthy of recognition. There is an illuminating section devoted to "articles described" but not accepted.

The book is valuable also in its revision and bringing up to date our knowledge on substances in common use such as arsenic compounds, barbitals, digestive enzymes, iron and iron compounds, serums and vaccines, glandular preparations, etc. It has also been necessary to add new material in the articles on medicinal foods and ergot preparations.

The book is extremely useful and contains information which the general practitioner will frequently require and which he can obtain nowhere else.

H. E. MACDERMOT

Preventive Medicine. Mark F. Boyd, M.D., M.S., C.P.H., Member of Regular Field Staff, International Health Division of the Rockefeller Foundation. Third edition, revised; 475 pages. Illustrated, \$4.50. London and Philadelphia, W. B. Saunders Company, Toronto, McAlinsh & Co., 1928.

That a volume such as this should have reached a third edition, in which all recent advances are recorded, is most satisfactory indeed, for it proves that the medical profession is taking a deeper interest in public health than ever before. Dr. Boyd has gathered together from many sources the main facts relating to preventive medicine, and has set them down concisely and clearly, so that medical men may have access to them quickly and easily. In the changing public sentiment of the past decade it is becoming very obvious that practitioners must take the lead in all fields of prevention, or it will pass into other hands.

This book is as complete as one could wish. Should one desire to follow any particular subject in more detail, there are abundant references at the end of each chapter. The illustrations, unlike those in many other text-books, are original and exceedingly instructive, particularly those relating to occupational diseases and food infections. The chapters on malaria and yellow fever are worthy of mention, but the rarer infections such as undulant fever are also considered.

If there is any fault to be found with the book, it is that many things are set down in table form, and give the appearance of a compendium. But in the space allotted it is not possible always to retain the narrative, and undoubtedly the tabular method of presentation makes the work more valuable for reference.

F. A. CLARKSON

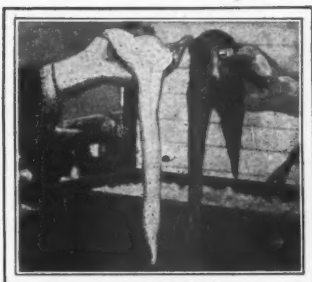


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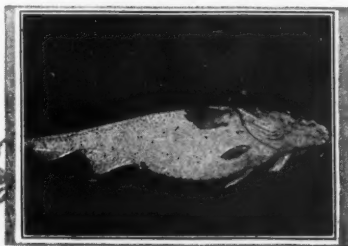


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Lectures on Internal Medicine. Knud Faber, M.D. 147 pages, 43 illustrations. Price \$3.00. Paul B. Hoeber, New York, 1927.

The etiology and pathogenesis of achylia gastrica is the title of the Nathan Lewis Hatfield Lecture given before the College of Physicians of Philadelphia.

The intestinal origin of pernicious anæmia was the presentation of Faber's well known investigations in this disease to the annual meeting of the American College of Physicians at Detroit.

Benign glycosæmia was the subject of the Herter Fund Lecture at Baltimore, and the Harvey Lecture at the New York Academy of Medicine was an historical outline of medical therapy.

Faber's lectures on clinical subjects should be read by every physician who did not have the opportunity to hear him or who is not conversant with his views on the subjects discussed by him. The Harvey lecture, with its well-chosen illustrations, is a most interesting presentation of the history of medical therapy. J. H. ELLIOTT

Lectures on Medicine and Surgery. New York Academy of Medicine. First series, 1927. 319 pages, 39 illustrations. Price \$5.00. Paul B. Hoeber, New York, 1928.

The lectures appearing in this volume represent the series delivered at the New York Academy of Medicine in 1927-1927 for the general practitioner. It is a collection of general interest. Fifteen in all, they cover a wide range of subjects, cardio-vascular and cutaneous syphilis, otological infections, eye conditions, general infections, contagious diseases, intestinal obstructions, surgical aspects of goitre and of medical conditions, useful drugs, the treatment of pneumonia, climate in tuberculosis, obstetrical problems, human misconduct, and the child's first year. The lectures have been given by outstanding teachers and clinicians. The book is published in Hoeber's best style, is easy to read, and can be recommended as presenting the best of recent medical thought as concerns the subjects under discussion. We think the profession in general will appreciate the work of the Academy's Committee on Medical Education.

J. H. ELLIOTT

Collected Papers of the Mayo Clinic and Mayo Foundation. Edited by Mrs. M. H. Mellish and H. Burton Logie, M.D. 1330 pages, illustrated. Price \$13.00. Philadelphia and London, W. B. Saunders Co.; Toronto, McAlinsh & Co., 1928.

This volume, as its name indicates, represents the various papers and addresses delivered by members of the Mayo Clinic and the Mayo Foundation during 1927, and published in many American and Canadian medical journals during 1927 and 1928, and here assembled in one volume. A vast amount of material is represented in this collection; however, only those which are of greatest importance, or which make most practical appeal, are here published in full; the others by title and reference only.

One cannot fail to be impressed with the vast amount of clinical material available for investigative and statistical purposes, and no less so by the research attitude which makes for such excellent work in the different departments.

No matter what the specialty, there are few pages that will not repay perusal. It would be only natural to expect, however, that one would most appreciate the sections which more directly affect his particular sphere of activity. Even allowing for this, it seems reasonable that one should single out from their excellent fellows for their particulars excellence, the papers on gastric and duodenal conditions, those on the biliary system, on renal malignancy, and suprapubic prostatectomy.

The biliary system is dealt with from its physiological and pathological aspects, having in mind its

clinical application, and constitutes a distinct step forward in the clarification of some of its more obscure phases. The papers on cholecystography and its limitations will be found to be decidedly helpful, as setting a better standard by which to evaluate the results of the Graham test; and by virtue of the deductions made from this investigation, they who have experienced the necessity for proceeding to surgery in the presence of strongly suggestive clinical findings and negative Graham test will be confirmed in their action.

Regarding the paper on "Punch prostatectomy," we confess to a feeling of disappointment in that no very definite conclusions are given as regards the indications and contra-indications of this procedure in the treatment of prostatic obstruction. The concealed knife, the cautery and the electro-coagulating apparatus are all advocated, but the reader is left in doubt as to which type of instrument is preferred.

The matter is well arranged, so as to appeal to workers in all the main branches of medicine, with even some reference to dentistry, and the discussion of general subjects of the final section gives the collection a finishing touch which can scarcely be over-valued. E. V. HOGAN

Gonococcal Urethritis in the Male for Practitioners.

P. S. Pelouze, M.D. 357 pages, illustrated. Price \$5.50. London and Philadelphia, W. S. Saunders Co.; Toronto, McAlinsh & Co., 1928.

This book has been written for the purpose of conveying to the general practitioner the experiences which the author has found satisfactory in the diagnosis and treatment of acute urethritis. The first part is taken up with a study of the gonococcus, the lesions produced in the urethra and adnexa, and the modes of infection. The early and late symptoms, together with the methods of diagnosis and treatment, are taken up in detail in such a way that the reader will find a great store of small practical hints which will be very useful. The treatment outlined does not include a number of alternative treatments, to the confusion of the student, but is the one which Dr. Pelouze has found of value in a large series of patients.

The chapter on the prostate includes a great many practical details of examination for diagnosis and slides of the normal and abnormal secretion. The treatment of each stage of acute and chronic urethritis is taken up in detail, together with the complications. In a special chapter devoted to non-gonorrheal urethritis, stress is laid on the fact that it is more prevalent than most people realize.

The second part of the book gives an analysis of a series of patients which presented a wide range of common and uncommon complications. A critical analysis of treatment is included and should be of great value as a reference for the management of difficult cases. This monograph is a splendid effort as an outline of diagnosis and treatment of gonorrhea, by a man who has had great success with it over a period of many years. J. C. McCLELLAND

The Opium Problem. Charles E. Terry, M.D., and Mildred Pellens. 1042 pages. Published by the Committee on Drug Addictions. New York City, 1928.

This volume will be invaluable to the research worker who is interested in the medico-social problem of chronic opium intoxication, because the authors have made available a digest of the work that has already been done in this field. They chose the title, chronic opium intoxication, in preference to addiction, disease, appetite, habit, craving, etc., hoping that this designation would be sufficiently comprehensive to cover the different phases of the condition. The Committee on Drug Addiction has completed a biblio-

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graphy of over six thousand items, the greater part of which is considered of little or no value (a tremendous waste of good Canadian pulpwood!). Some four hundred contributions were considered worthy of analysis.

It may surprise some to learn that De Quincey's "Confessions of an English Opium Eater" (1841), according to the authors, had far reaching effects, and even to-day its pernicious effects are felt. The consensus of opinion of the writers cited is that the origin of the majority of cases of chronic opium intoxication lies in the therapeutic use of the drug, but one is cautioned to balance that against the fact that there is an incompleteness of data. Until the pathological changes have been studied and are understood no rational treatment can be applied. Some of the authors stress the difficulty of diagnosis, especially when the patient is in "perfect balance." A contracted pupil may or may not be present. No satisfactory explanation of the withdrawal symptoms has been given. There is unanimity of opinion that the manufacture of heroin should be prohibited. Nearly one-half of the volume is devoted to the study of international, national, state and municipal control. The Harrison Narcotic Law has many vexations for the physicians, and if Canadian physicians wish to obviate the necessity for such a law they should become more familiar with the provisions of the Federal Opium and Narcotic Drug Act.

The index is rather meagre, but this is compensated for by the bibliography. J. W. CRANE

The Extra Pharmacopœia. Vol. I. W. Harrison Martindale, Ph.D., Ph. Ch., F.C.S., and W. Wynn Westcott, M.B., D.P.H. Nineteenth edition. 1207 pages. Price 27/6 net. H. K. Lewis & Co., London, W.C.1, 1928.

A modern official pharmacopœia has at best a limited range, and there is a great necessity for something else which will include all the miscellaneous information which exists regarding drugs and their employment. The "Extra Pharmacopœia" is designed to meet this necessity. It has done so for the last forty-five years, and judging by the frequent revision which it undergoes (this volume is the 19th edition) there is reason to expect that it will continue to do so for years to come.

The present edition has taken advantage of the various new editions of national pharmacopœias which have appeared in the United States, Germany, France and Sweden within the last three years. In addition to this, however, it possesses the feature which has always been outstanding in its completeness, that of abstracting the current literature over a very wide field of knowledge. It is a very unusual point on which the Extra Pharmacopœia fails to furnish some information. It is, however, on the matter of recent advances in therapeutics that one looks for guidance in new editions, and no advance of note has been omitted here. The treatment of pernicious anaemia with liver, recent work on vitamin D, the use of ephedrin in asthma, recent developments in organotherapy (though still with the admission that endocrinology is far from being an exact science); discussion on lead therapy in cancer; lack of consensus of opinion on the value of tuberculin on which there is "no consensus of opinion"; these are a few of the points noted.

The book is indispensable as a fully, carefully edited, and convenient index. H. E. MACDERMOT

Ernest Harold Baynes. Naturalist and Crusader. Raymond Gorges. 255 pages, illustrated. Price \$4.00. Houghton, Mifflin Co., Boston, 1928.

There are men whose work is not easily classified and Ernest Harold Baynes is one of them. He was a lover of animals, of flowers and wild life, and a writer of stories and a lecturer, but while he was a naturalist he had no university degrees in biology or botany, and he cannot be classed among leading modern authors.

But, he was one of those rare men whose character and charm of personality carry them through life without any of the guiding influence (sometimes cramping) of a professional training. If he was a very delightful dreamer of dreams he was also possessed of a keenly practical and well-ordered mind, capable of impressing President Roosevelt to the extent of setting in motion the legislation by which the practically extinct bison was preserved and brought to the present increase of numbers, both in the United States and in Canada.

From this work he turned to the preservation of wild bird life, and this gradually absorbed his whole time. It was as a kind of climax to his years of lecturing and writing that he eventually asked a friend to write a poem for the occasion of opening a bird sanctuary at Meriden, and so occasioned the production of the masque "Sanctuary."

Shy and diffident he may have been, but he could be roused to passionate outbursts by cruelty to animals. In one of his denunciations of the trade in plumage as ornaments he said, "I do not pretend to know God, as these women who wear upon their heads the plumes of slaughtered birds claim to know Him; but if I wore such emblems of heartless vandalism on my brow, I would not have the impudence to get down on my knees and ask any favours of Him!" And again, on seeing displayed for sale one of the "Chanticleer Bow" ornaments, which had been suggested by Rostand's play, "I could hardly believe my eyes, and I looked again to make sure it was nothing less than the head of that world-famous songster, the European skylark.

'Hail to thee, blythe spirit,
(Bird thou never wert),
That from heaven, or near it,
Pourest thy full heart.'

Shelley's lines ran mockingly through my head, as I looked at that pathetic tiny bunch of brown feathers, with its staring glass eyes and its shrivelled bill—all that was left of the most joyous, joy-giving bird that ever sprinkled the air with its songs. And the price of it, bow and all, was fifty cents! And for a tithe, then, of this paltry sum, there had been destroyed such beauty, such poetry, such joy, as could not be replaced by a syndicate of billionaires . . .

But even his affection for animals could not sway him into the senseless fanaticism of the anti-vivisectionist. He examined the question of animal experimentation at first hand, and his investigations soon showed him what irrational and hysterical methods the anti-vivisectionist worked. Far from gaining his support the anti-vivisectionists found him an uncomfortably vigorous and capable opponent.

This biography manages, though with no particular literary skill, to give a picture of one with a lovable nature, a clear brain, and indomitable courage in fighting the battle of those who not only cannot fight us but should never receive anything but our admiration and affection. H. E. MACDERMOT

Sterility in Women. Diagnosis and Treatment. Sidney Forsdike, M.D., B.S., F.R.C.S. 133 pages, 25 illustrations. Price 9/- net. H. K. Lewis & Co., London, 1928.

This little book might seem to be a work of super-erogation in these days of so-called "advanced news." But there is still some demand for the solution of this problem, and Dr. Forsdike handles the question admirably. He starts out with a definite plan of campaign, which is followed step by step to the end, unless he finds the solution sooner. And one very pleasing feature is that his plan, if he does not easily find a solution in the female side, is to shift over to the male, and make him prove his fertility, before subjecting the female to the later and more distressing parts of the examination.

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The book is well written, clear, lucid and concise, and calls for nothing but praise. P. M. CAMPBELL

Methods and Uses of Hypnosis and Self-Hypnosis.

Bernard Hollander, M.D., M.R.C.S., L.R.C.P. 191 pages. Price 6/- net. George Allan & Unwin Ltd., London, W.C.1, 1928

It is stated on the cover that this book will be of interest to medical and psychological experts. Most medical men and psychologists would regard the book as a popular one, and would consider the introduction of such subjects as premonitions, apparitions, clairvoyance, telepathy, the human aura and the like, as being irrelevant. DAVID SLIGHT

The Examination of the Central Nervous System.

Donald Core, M.D., F.R.C.P., Honorary Assistant Physician, the Manchester Royal Infirmary, 248 pages, 14 illustrations. Price \$2.75. Edinburgh, E. & S. Livingstone; Canada, MacMillan Co. of Canada, Toronto, 1928.

To the student of medicine, to the neurologist and to others interested in the examination of the central nervous system, this will prove to be a very interesting book. As the title implies, it deals simply with the routine examination of the central nervous system and correlates some of the more common pathological signs and symptoms under the appropriate categorical syndromes.

In the main the author has not diverged from the average text-book on this subject, except in the latter chapters where the nervous disorders are considered from a chronological, congenital, and mode of onset point of view. A. W. YOUNG

Diseases of the Intestines Including the Liver, Gall

Bladder, Pancreas and Lower Alimentary Tract. Anthony Bassler, M.D., F.A.C.P. 905 pages, 199 illustrations. Third edition. Price \$10.00. F. A. Davis Co., Philadelphia, 1928.

This volume is one of a series of works on present day medicine published by F. A. Davis Company. It is the third edition of this work and compares favourably with previous editions, having in addition new articles on diseases of the liver, gall bladder and pancreas. The general form of the book is pleasing, the illustrations satisfactory although the x-ray pictures could be clearer.

A considerable portion of the volume is devoted to the functions and methods of examination of the intestinal tract. Some of the examinations detailed are laborious and unnecessarily meticulous. The author appears to be favourably impressed with the Meltzer-Lyon test and has evolved some laborious tests to be done on the pancreatic juice obtained by duodenal tube. No mention is made of the starch tolerance test. Over seventy-five pages are devoted to the subjects of putrefaction, indicanuria and intestinal auto-intoxications while one or two pages suffice for Evarts Graham's work on cholecystography.

Aside from these minor discrepancies the sections on other subjects are admirably written and up to date. The section on constipation might perhaps be more emphasized, that most common of present day ailments, the spastic colon, receiving but a few lines. The book is interesting, written from the practical gastro-enterologist's standpoint rather than the academic, and will no doubt be of much value to the physician.

E. W. MONTGOMERY

A Shorter Anatomy With Practical Applications. E.

Wolff, M.B., B.S., F.R.C.S. 451 pages, 130 illustrations. Price 18/- net. H. K. Lewis & Co., London, 1928.

This book is described by the author as "A Shorter Anatomy". All well-intentioned attempts to

shorten descriptions in human anatomy would be heartily welcomed by students, but one cannot quite fathom the purpose of this author in shortening anatomy by omitting such important organs as the brain, the heart, the lungs, etc. The section allotted to the thorax deals only with its surface anatomy. The author has not attempted to describe the regional anatomy of the thorax at all. It is therefore rather puzzling to determine what is the exact purpose of the book, and to which constituency it is intended to make a special appeal. If, as the author claims, "the book is especially intended for those revising their anatomy for the final examinations," how can this claim be substantiated, when the book does not cover the whole of the regional anatomy of the body?

The book is written apparently by a surgeon-anatomist, which explains the fact that much space is allotted to applied anatomy. This constitutes an attractive feature of the volume. The author has attempted a semi-systematic, semi-regional plan of description. It is difficult, however, to understand why he should have decided to give an account of the courses of the nerves and blood vessels prior to a description of the muscles, which are such deciding factors in the relationships of these structures. Similarly, in the abdomen, the discussion of the peritoneum should be placed before the description of the viscera, instead of at the end.

The section on ossification and epiphyses is the best in the book, and is illustrated by some excellent skiagrams.

A few errors and omissions can be detected. For example, on p. 257 the word "stomata" is misspelt. Again, in the distribution of the deep branch of the ulnar nerve given on p. 16, the short muscles of the little finger are left out.

The book is printed in large clear type, and is excellently bound; but the illustrations are on the whole disappointing. Some of them are rather crude, and others are too much overburdened with detail—a confusion of vessels, nerves and tendons in black outlines. The descriptions are attractively written and very readable, and there is a useful and comprehensive index. JOHN CAMERON

Lee's Microtometist's Vade-Mecum. Edited by J. Bronte

Gatenby, M. A., Ph.D. (Dubl.), B.A., B.Sc., D.Phil., D.Sc., etc., and others. 710 pages, 9 illustrations. Price \$7.50. P. Blakiston's Son & Co., Philadelphia; 1928.

As a reference book on methods employed in microscopical anatomy in the various branches of biology this work is very well known. In this new edition there has been an enlargement of the embryological, cytological, protozoological and entomological sections. New sections have been added by Dr. Robert Chambers and Dr. W. R. G. Atkins. The protozoological section has been rewritten by Dr. Helen Pixell-Goodrich, and Dr. Greenfield has added new material to the sections on the nervous system.

This work has passed through numerous editions with considerable increase in material and a broadening of its scope. As a handbook of reference it has considerable value and forms a valuable aid to the laboratory worker. Methods are often given with considerable brevity, but references to the original articles are placed conveniently in the text after the author's names. In the chapters which cover subjects with which the reviewer is particularly familiar he feels there is a tendency to include many old and useless methods which could well be omitted, and thus allow more space for the better, well recognized techniques which are generally employed.

T. R. WAUGH